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SHODH DARPAN

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EDITORIAL

It is with great pride, enthusiasm and anticipation that I invite you to read the Volume 3 No. 1 of the journal **Shodh Darpan**. An enormous amount of work has gone into the development of this journal and I believe that you will see the efforts reflected in this edition and in the impact it will have on the field.The aim of the journal is to percolate knowledge in different fields of research with erudition by providing our ecosystem for budding researchers in India.

The International Journal **Shodh Darpan** welcomes submissions that explore the aspects of Social Sciences, Education, Technology and Science. I humbly invite all the authors and professional colleagues to send their research papers for publication in our forthcoming issue as per the "Guidelines to Authors" given in this issue. I appreciate the time and effort that have been devoted by the different contributors and would like to thank them all. As always suggestions towards improving the content of the journal are most welcome. I must give special thanks to management, editorial board members and staff members, who had the vision to embark on this project.

- Sushil Kumar Sahu

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Migration and Livelihood Opportunities: Push and Pull Factors with Special Referenece to Bastar Region of Chhattisgarh

Prof. Pratibha J Mishra[1], Ms Nadia Ahad[2]

Abstract

Migration is a global phenomenon caused not only by economic factors, but also by social, political, cultural, environmental, health, education and transportation factors. It commonly takes place because of the push factor of fewer opportunities in the socio-economic situation and also because of pull factors that exist in more developed areas.

The rural areas of Bastar region is an underdeveloped, tribal populated remote region of Chhattisgarh which is highly affected by the LWE activities. Literacy rate of this region is very low. Maximum youth of the region are either semi educated or illiterates. Lack of awareness and incompetency to fight and win employment in outer world is encouraging the youth towards extremist activities. Because of less number of employment opportunities in these areas people are forced to migrate in urban areas. However, LWE is not only reason that can be attributed to a large scale migration during the last decade. Factors like an epidemic, scarcity of food, poor health facilities, and dearth of sources for livelihood or existence of any other 'push' factor resulting in a mass exodus.

According to a few experts, the trend can be attributed to decrease in livelihood opportunities (caused by deforestation) and counter-insurgency operations resulting in large-scale migration out of the Naxalite and tribal rural belt of Chhattisgarh. The CAG report of 2013 had also pointed to loss of forestland, triggered by large-scale industrialisation, as a reason for migration of tribals.

In contrary to that, better economic opportunities, security and protection, better education and health facilities, more jobs, and the promise of a better life become

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attracting factors for the rural people which pull them to move towards various cities of Bastar region

Thus there is a need of social intervention to address this issue. The government has to start such project and programmes for tribal population which can stop the rural migration through creating various livelihood opportunities at their place of origination. It is the time to have familiar with them and their culture for their proper development rather than humiliation and isolation.

With the above background the present study enumerates the push and pulls factors of migration in rural areas of Bastar district and suggests some social intervention methods for their overall development.

Introduction

According to census of India 2001, Chhattisgarh attains the rank of 8th among top ten states for intrastate migration (rural to rural) by last residence. And it was identified that 1,360,501 persons of Chhattisgarh migrated from rural to rural areas which comprises the 69.2% of total intra-state migration. The report also reflects that in Chhattisgarh both male intra-state migration rate and female intra-state migration rate are more than 10%.

India's urban population which was 17 per cent in 1951 is expected to jump to over 42 per cent in 2025. The increase will be on account of migration of people from rural areas, who will shift location in search of greener pastures. In the last 50 years the rural population has decreased from 82.0 to 68.9 per cent. Migration is the barometer of changing socio-economic and political conditions at the national level and speaks of the levels of economic inequalities existing in the economy.

With the share of Gross Domestic Product (GDP) of agriculture falling sharply from around 40 per cent in the 1990's to around 15 per cent, large number of people along with their families are shifting to urban areas in search of better opportunities. Some say they are being squeezed out because of "Push Factors", while other academicians say they are getting attracting to urban life because of" Pull Factors". Whatever the reason,

migration has led to increase in incomes which have come with the pain of poor living conditions in the urban areas. While planners argue that migration should be reversed by giving the same level of economic opportunities back in rural areas, others argue that the migrants have a right to change location and also have the right to live in a dignified way and should be provided with the amenities by the government.

There is a new class of migrants which is on the increase recently. These are called "Environmental Refugees" who can no longer gain a secure livelihood in their homelands because of drought, soil erosion, desertification, deforestation and other environmental disasters. In this issue we discuss the causes of migration and the resultant affect on the people who migrate from rural areas of Bastar to urban areas. Rural migration is still largely a survival or a subsistence strategy.

Overview of Bastar Region of Chhattisgarh

Bastar District is a district of the state of Chhattisgarh in central India. Jagdalpur is the district headquarters. The district has an area of 10755.79 km. Bastar District is bounded on the northwest by Rajnandgaon District, on the north by Kondagaon District, on the east by Nabarangpur and Koraput districts of Odisha state, on the south and southwest by Dantewada District, and on the west by Gadchiroli District of Maharashtra state. It possesses a unique blend of tribal and odia culture.

Bastar, the land of tribes and about 70% of the total population of Bastar comprises tribals, which is 26.76% of the total tribal population of Chhattisgarh. The major tribes of the Bastar region are the Gond, Abhuj Maria, Bhatra Bhatra are divided into Sub Cast San Bhatra, Pit Bhatra, Amnit Bhatra Amnit Hold Highest Status, Halbaa, Dhurvaa, Muria and Bison Horn Maria. The Gonds of Bastar are one of the most famous tribes in India, known for their unique Ghotul system of marriages. Gonds are also the largest tribal group of central India in terms of population.

Phenomenon of Migration in Bastar

The present scenario of Bastar region of Chhattisgarh is quite paradoxical where majority of the rural population is striving hard for survival with no option but to migrate in search

of jobs to far away destinations. The rural urban divide has become more distinct in the drought conditions, which is yet to have a significant impact on urban centres. Despite the provision of employment guarantee scheme (EGS) of the government the flow of peasants and rural labourers till now goes unabated in the region.

Concept of Migration

Migration has taken a pivotal place in the present development discourse. Many economists view it as an integral part of demographic transformation having greater potential for poverty reduction and economic growth. It has different dimensions and these dimensions could be analysed in terms of "WHO" migrates and "WHY".

Migration can be defined as the movement of a group of people from one place to other. It has a watertight link with the avenues of income available at the destination. It can be permanent or semi-permanent. Sometimes migration is voluntary, but many times people are forced to migrate because they do not have any other choices. Labour migration is a part of semi-permanent migration also called seasonal migration.

The word migration has been defined by many authors. Dr. S. N. Tripathy writes, "Labour migration is a form of labour mobility towards district or state or outside where industry and employment are expanding. In other words, migration may be the phenomenon of the flow of the people over shorter or longer distance from one origin to a destination either for temporary or permanent settlement."

Migration: Reasons

Rural people migrate due to various reasons, which vary from region to region. In the state of Chhattisgarh and especially in the Bastar region, migration is frequent and involves millions of families and individuals. Naxalism is the most important factor responsible for rural-urban migration in Bastar region besides underdevelopment and the degree of poverty are other pull factors in this region. The area is mostly rain-fed and villagers have very limited sources of income and employment during the lean season. Without alternate sources of local employment the impoverished villagers are left with two options: migrate or starve.

Some villagers migrate in order to supplement income during seasons when local work is unavailable. However, among the landless, small and marginal farmers belonging to Scheduled Tribe, Scheduled Caste and Other Backward Communities, migration as a survival strategy is far more common.

Perspectives of Migration

Standing (1981), following the Marxist framework, has provided a materialistic interpretation of rural/urban migration. According to him the conditions of migration are as follows -

1. The decision to migrate is considered to be an acceptable response to adversity and frustrated aspiration.

2. The villagers deem their exploitation as being unjust and not inevitable, which means in practice that some reciprocal relationship must have been violated to cause a sense of deprivation.

3. A revolt must appear to have minimal chance of success, or the class solidarity of the oppressed must have been undeveloped or have given way to disjointed anomie.

4. The potential migrant must have had cause to reject customary forms of oppression and exploitation because of a sense of deprivation or inability to satisfy his traditional level of subsistence.

Push Factors of Migration in Bastar

Migration is being attributed to push and pulls factors. While push factors are mostly repelling and compelling ones the pull factors are largely the attracting ones. An analysis done by Greenwood on migration to urban areas in India using 1961 census data concluded that economic factors such as transportation costs, income and job opportunities significantly affect individual's decision to migrate to city in less developed country like India. The push factors include the population pressure, declining yields, institution of marriage, disintegration of joint family system, lack of livelihood opportunities, etc; the pull factors include better educational, health care facilities,

modern means of transport and communications, more employment opportunities and a growing craze for urban life.

Naxalism: A Darker Aspect

Naxal Movement is the biggest threat and hurdle in between of development in the tribal dominated areas of Bastar region of Chhattisgarh especially adjacent to the other states. Naxali movement has grown dramatically in all over Chhattisgarh; Red zone in the map beside clearly shows that how naxal movement has affected the state. From the Bastar division (Bastar, Kanker, Narayanpur, Bijapur and Dantewada districts), which comprises the major chunk of the Danda-karanya region, the worst Naxal affected region in the country, reportedly over 30,000 families have crossed over to the bordering Khammam and Bhadrachalam districts in Andhra Pradesh. Khammam and Bhadrachalam also form a part of the Dandakaranya region which helps the migrants from Chhattisgarh to identify with the local population in these areas.

As per the report submitted by National Human Rights Commission (NHRC) in August, 2008, about 40,000 persons were in relief camps in Dantewada and Bijapur districts. These relief camps were meant for people who had moved out of fear of naxal attacks. Civilian in these areas are regularly targeted/attacked by Maoists for their suspected anti Maoist activities. As tribals form a segment of civilian population residing in naxal-affected areas, they also are affected by such violent activities of the Maoists. The Naxals suspect them to be police informers while the security agencies believe them to be Naxal sympathisers thus this situation put them in no other option but to migrate towards city.

Environmental Imbalance

The legendary forest of Bastar particularly the Sal forest have depleted fast during the last fifty years. Earlier, these forests were so thick and dense that the sun rays never fell on the ground due to close canopy of tall trees. However, the situation has changed. Deforestation and related activities have had a detrimental effect on the environment and the people dependent on forest. The environmental imbalance adversely affects the life style of the tribal people who derived their sustenance from the forest around them.

Tribals have always been able to draw nearly half of their food requirements from the innumerable edible produces of the forest. Thus, effect of famine has been limited in earlier times. However, the situation has changed to the detriment of the people. Forest has diminished along with a large variety of wild life that was there. Rivers and streams are no longer perennial. So far no viable alternative is available to the people who are struggling for their own survival in a deteriorating environment but to migrate from their hinterland. The region is facing severe problem of environmental imbalance. Removal of large number of trees for timber has completely changed the climate.

High Risk Agriculture

The present agricultural production and marketing system is such that both the consumers as well as producers are running a high loss economically and high risk existentially and environmentally. Economically the consumers pay more and more while the producers get less and less. The overall assessment of the present agriculture in the region, therefore, is that it is running on two rails; high loss and high risk. Therefore, the foremost concern of the future agriculture is to minimize the element of high loss and high risk. The future agriculture should restore the quantitative and qualitative balance of all major components like soil, water, air, plants, animals and human beings in the eco system. Agriculture, though highly hungered and praised is now becoming least preferred occupation now people want to avoid, risking human energy. Future agriculture is moving towards a state of least human energy utilization. The basic human justice demands that we gratefully acknowledge the immeasurable contribution made by the vast mass of population of the past and present by doing agriculture by their raw manual. Due to various adverse factors and fault in the present economic system they are not being remunerated with adequate compensation. This area needs adequate attention to make agriculture less risky and profitable.

Climate Conditions

A deficiency of 40% in seasonal rains in Chhattisgarh has just crippled the problem of peasantry of the whole of this newborn State. 50 cms drop in average rain in the past 100 years has affected adversely i.e. crops specially paddy cultivation. This is evident from the

fact that over 800 rice mills have closed and more than 700 mills are currently inoperative leaving only 100 mills operating on reduced capacity.

Though the general belief remains as if the shortage of rains is the sole reason behind the creation of such conditions it is not so. After carefully examining the nature of migration it becomes very clear that a big chunk of population which has to migrate in search of livelihood are due to marginalisation of peasants and landlessness, fragmentation of land holdings, lack of irrigational facilities resulting in less production and non-availability of employment opportunities for about 2/3 of each year, non-accessibility to forest and forest produces etc. In addition, deforestation, a well-known reason for irregular monsoons contributes significantly to the process. Afforestation is needed to correct the imbalance in the long-term alongwith creating employment opportunities for a large number of people on regular basis. Facilitating participation of the local population in policy making and programme implementation through panchayats and other institutions shall also contribute significantly in improving the situation.

Development Induced Displacement (Forced Migration)

The government has created number of sanctuaries in the name of protection of wild life in Chhattisgarh. In this process many tribals are forced to leave their villages falling inside the sanctuaries. This has affected livelihood, identity, human rights and nature and human relationship. The democratically elected governments and its wings in planning and administration have not been able to contain the mass exodus of the hapless rural Chhattisgarhi people as a consequence of development interventions. Various plans and projects of development have rather uprooted the local population without proper plans for their rehabilitation. The industrial and mining activities have only forced the locals to evacuate from their ancestral land. It is a man made tragedy that has made large number of people homeless and deprived in the region. Under these circumstances the relevance of predominant paradigm of development is under question. A paradigm which forces migration, displacement and evacuation of large of poor and villages mostly belonging to tribals and indigenous groups needs to be corrected.

Population Pressure

The growing population pressure on our natural resources has led to a stage where they are being used and depleted at a rate more than their natural rate of formation. The population pressure limits already limited opportunities and resources in the rural areas. More population means more and more peoples have to share the limited resources available with the rural families. This also forces them to migrate to safe destinations. Decreasing per capita availability of land: The increasing population has led to the fragmentation of land. The per capita availability of land has decreased considerably. More than eighty per cent of the farmers are now marginal and small. Such small holdings have now become uneconomical. The growing number of farmer suicides and the dropping out of farmers from their profession is an indicator of this. Farming community is now looking out for other alternatives. This also has catalytic effect in migration to urban centres for better earning opportunities.

Lack of Storage and Market Facilities

The godowns of Food Corporation of India, Chhattisgarh Warehousing Corporation, Marketing Federation etc. are full to capacity. As a matter of fact the market is facing the problem of plenty and there are no buyers. Contrast to this situation, people does not have accessibility to minimum requirements. The loss of entitlement of the poor needs to be restored by providing them with job opportunity to increase their purchasing capacity. Once the rural population becomes capable of purchasing food grains, it will certainly help in making the market dynamic.

In Bastar the small land holdings and continuous fragmentation has an alienating effect. The productivity declines due to over and excessive use of chemical fertilizers and HYV seed and pesticides etc. Inputs like good quality seeds, irrigation facilities and pest control become extremely rare and expensive. Farmers do not get proper remuneration and return. Use of modern system and technology are out of reach for small and marginal farmers. The economy and market are controlled by traders and business community. The major policies and decision are made on political consideration rather

than social. The cumulative results of all these facts are wide spread poverty, food in-security, unemployment which leads migration.

Poor Helath Facilities

The interior villages are particularly cut off from the health centres. In villages people have to walk many kms to reach the primary health centre (PHC). There is a critical shortage in health infrastructure and basic services. A survey of the Ministry of Health and Family Welfare done until 2015 underscores this. Dantewada district has only 11 PHCs for a population of 533,638, of which 82 per cent is rural. This means there is roughly one PHC per 48,500 people. Even these few centres rarely have full time doctors. Equally challenging is the health and nutrition support to children and women in the villages. While there are anganwadi centres, nutrition education among the workers and the monitoring of nutrition and growth are not up to the mark. Thus lack of primary health centres, doctors, medical practitioners, poor health facilities and infrastructures induced people to migrate.

Lack of Opportunities for Higher Education and Employment

Lack of opportunities for higher studies, technical trainings, vocational trainings and employment for rural youth of Bastar region compelled to migrate from their villages to their nearest urban centres.

Indebtedness

Indebtedness is the reason for tribal people to migrate. In absence of adequate livelihood support, employment, credit support and income in order to meet the basic necessities of food, cloth, medicine and other social and agricultural needs, the poor are caught in the vicious circle of indebtedness. The high rate of interest for loans from money lenders is a major setback for the poor. Once people are caught in this trap it is difficult to get rid of the loan. In many cases this continues throughout the life and also leads to different kinds of exploitation of the whole family from generation to generation.

Majority of the families in the area are indebted. Due to ignorance and illiteracy they are cheated and exploited by manipulating the records and mortgaging valuable goods against the low amount of loan. This has also become an instrument for transfer of land from tribals to non tribals which is prohibited by the law.

Pull Factors of Migration in Bastar

- Agricultural workers of rural Bastar moved to the towns and cities to work in various unorganized sectors that required unskilled labour with accommodation facilities and good working condition.
- The impact of environmental imbalance can be minimized by resorting to a community based long and short term plan for afforestation using local variety of trees which are useful and valuable, fast growing and of multiple use i.e. provide timber, firewood, fruit, fodder, fiber to the people; particularly the forest dwellers. The strategy for protection of existing vegetative cover and increasing natural regeneration needs considerable attention. The forest department has to check use of forest for commercial considerations. It is also important on the part of other States to strengthen their own forests through intensive efforts reducing dependency on others. The over arching focus has to be placed simultaneously on policy advocacy for effecting pro forest dwellers changes in the different acts as well as restore peoples access to forest and forest resources. There is also an urgent need for development of collective understanding for community participation in use and management of forest resources.
- The areas which once were inaccessible and beyond reach are now accessible having good roads, communication and transport facilities. This has favored migration of the rural communities. Whenever they have lean periods or off season they migrate to urban areas for earning and then return back with the start of sowing season. Such type of seasonal and circular (also known as cyclical, oscillatory) migration has long been part of the livelihood portfolio of poor people across India.
- The rural people find various opportunities for employment in new emerging factories

and industries of cities like steel plant in Nagarnar, Bastar and NMDC at Dantewada. Big companies offering new employment opportunities, career advancement and high wages.

- Cities are the hub of various entertainment facilities. People move to cities to enjoy new recreational resources and cultural facilities
- City and town living provides easy access to goods and services that ensure convenience and variety
- Educational facilities in towns and cities offer a range of choice and access to education for all ages and easy access to colleges and universities providing better education. Bastar universities, govt. medical college, govt. engineering college and various other private institutes are there in Bastar.
- Religious and political activities can be carried out more safely and with greater acceptance in urban areas of Bastar region.
- Better healthcare services available at Bastar district also act as a pulling force for the rural peoples.

Checking Rural Migration

Rural migration is still largely a survival or a subsistence strategy. Survival strategy indicates that the prevalent economic and social conditions force the rural peoples to migrate for a longer time in order to stay alive. The second reason for migration is a short term measure and it is mainly due to need to supplement income in order to fill the gaps of seasonal employment. Therefore following strategies can be employed effectively to check migration:

Providing Urban Facilities in Rural Areas (PURA)

The concept of PURA was the brainchild of our former president Sh. A. P. J Abul Kalam. The objectives of PURA are proposed to be achieved under the framework of Public Private Partnerships involving Gram Panchayat. The state government actively supports the activities under PURA. Amenities to be provided for rural infrastructure include

drinking water facilities, sanitation, sewerage, village streets, drainage, solid waste management, skill development etc.

Suggestions

1. National governments have the primary responsibility for the security and well-being of all migrated people on their territory. Chhattisgarh state government should take all necessary and appropriate measures to end unlawful naxal activities. Chhattisgarh state government should establish conditions for and facilitate the safe return or resettlement of camp residents and other displaced persons who voluntarily choose to return to their villages. The Maoist party should immediately end abuses-such as killings, threats extortion, and the indiscriminate use of landmines.
2. Agriculture as a major mainstream livelihood activity for the people of rural Bastar is now being perceived as a failure due to the rising costs of cultivation and a declining returns thus making it non remunerative. As such it is necessary that agriculture be made more profitable by suitable interventions. The process of migration needs to be dealt with multi level planning and not individual efforts. Migration should not be seen as a merely survival strategy or an escape route, but a social process that contributes to the well being of the society, that promotes cultural diversity, specialization and division of labour and spirit of unity among diversity. Increase in agricultural productivity may deter the migration process. The government should promote sustainable agricultural practices in general and at the areas where migration is dominant in particular through special provisioning of irrigation, high yield variety seeds, fertilizer in subsidized rate. Beside, provision of agricultural credit facility at large and crop insurance may add to the effort.
3. Rural population, if provided with suitable livelihood opportunities will not go for migration. This has been authenticated by various research studies involving Mahatma Gandhi National Rural Employment Guarantee Act which provides for 100 men days of work to each family on the rural areas. Although the MNREGA has started with best of intentions but real benefits is not being shared by the target demography. There is lot of loopholes at the stage of implementation and accounting

process. Bringing rigor and transparency in implementation and furthermore community involvement may certainly control migration in large scale.

4. Provisioning of better and adequate education and health facilities in the rural area is one of the essentials to control the pace and magnitude of migration. Beside, vocational education should be added to the curriculum and especially for rural colleges so as to give a practical exposure to the rural students to get their livelihood. The government should give importance to social sector development especially on housing, drinking water, medical facilities and education too.
5. Dairying, poultry and various occupations have become the secondary source of income among many families in rural areas of Bastar. The government should give more emphasis to the National Diary Plan to increase milk production and thereby creating avenues to keep hold the people to their indigenous occupations. Similarly focus should be given on fisheries and poultry as a source of income and employment to revamp the rural economy.
6. The government should encourage other allied sectors to enhance job creation in the villages through high value agriculture like horticulture, floriculture and etc.
7. To increase income and employment, the government should ensure development of non-farm rural activity, beside its farm counterpart.
8. Village Entrepreneurship Program should be initiated and incentives should be provided to the rural youth to start their new venture with the help of available rural resources. To make it more successful, the government should provide training and teach them necessary skills for excellence.

Conclusion

Chhattisgarh is one of the richest Indian states in terms of forest mineral wealth. As matter of fact, rural mineral rich forest area belongs to the original inhabitants of this territory, who are mainly the Adivasis. Indian state introduced neoliberal reforms in late nineties and early twenties that cleared the way for opening primary industries and resource extraction industries to national and foreign private capital. As a consequence investments and activities of private national and international mining companies

significantly increased in resource rich regions of Chhattisgarh. Though the GDP of the state has improved tremendously in the last decade the state's poor instead of reducing has increased. The problem is that these ventures are largely in direct conflict with the interests of rural mass, primarily tribals. The Indian state supports private mining companies in gaining ground in these tribal areas by legally dubious means. Today the rural areas of Bastar region have huge issues pertaining to Naxalism, unjust land acquisition by corporate, exploitation of water and forest resources, acute poverty which undermines the rights of the local tribal people and induced them to migrate toward urban centres. National governments have the primary responsibility for the security and well-being of all migrated people on their territory. Chhattisgarh state government should take all necessary and appropriate measures to end unlawful naxal activities. Agriculture as a major mainstream livelihood activity for the people of rural Bastar is now being perceived as a failure due to the rising costs of cultivation and a declining returns thus making it non remunerative. As such it is necessary that agriculture be made more profitable by suitable interventions. The process of migration needs to be dealt with multi level planning and not individual efforts.

References

1. Abbasi, S. R. S. and Sheikh, K. (2000), "Impact of Foreign Employment on the Social Development of Migrants' Families Left behind in Pakistan", *Journal of Rural Development and Administration,* Vol. 32, No. 3. pp. 88-101.
2. Ali, Lyakat (1997), "Unorganised Labour and the Legislative Measures for their Welfare", *Social Action,* Vol. 47, April-June, pp.181-199.
3. Bharti, Indu (1990), "Mobilisation of Agricultural Labour: Jehanabad Experience", *Economic and Political Weekly*, Vol. 25, No. 22, pp. 1181-84.
4. Bhujan, M. C. (1971), "Immigration to Assam Valley: A Geographical Analysis", *The Journal of North-East Indian Geographical Society,* Vol. 3, No.1, pp. 177- 89.
5. Dasgupta, Biplab (1975), "A Typology of Village Socio-Economic Systems", *Economic and Political Weekly,* Special Number, August, pp. 1395-1414.
6. Dasgupta, B. and Lashley, R. (1975), "Migration from Villages: An Indian Case Study", *Economic and Political Weekly,* Annual Number.

7. Duraisamy, P. and Narasimhan, S. (2000), "Migration, Remittances and Family Ties in Urban Informal Sector"*, The Indian Journal of Labour Economics,* Vol. 43, No. 1, pp. 111-119.
8. Ghaffari, Hadi and Singh, S. P. (2000), "Pull-Push Determinants of Inter-Provincial Migration: Iran's Case Study", *Indian Journal of Economics,* Vol. 81, No. 321, pp. 269-275.
9. Gupta, M. (1993), "Rural-urban Migration, Informal sector and Development Policies: A Theoretical Analysis", Journal of Development Economics, Vol. 41, No.2 pp.137-151.
10. Gupta, T. R. (1961), "Rural Family Status and Migration: A Study of a Punjab Village", *The Economic Weekly,* Vol. 13, No. 14, pp. 1597-1603.
11. Iyer, G and Singh, M. (1980), "Impact of Migration Labour on the Rural Economy of Punjab State", *Man and Development,* September.
12. Kumar, Sudhir (1992), "Migration and Economic Development", *Journal of Social and Economic Studies,* Vol. 9, pp. 115-132.
13. Kundu, A. (1986), "Migration, Urbanisation and Inter-Regional Inequality: The Emerging Socio-Political Challange", *Economic and Political Weekly,* Vol. 21, No. 46, pp. 2005-2008.
14. Mahapatra, Mihir Kumar (1998), "Labour Migration from a Backward Region of Orissa", *The Indian Journal of Labour Economics,* Vol. 41, No. 4, pp. 737-744.
15. Mehta, G. S. (1996), "Employment Structure and Earnings of Migrant Workers in Urban Economy", *Manpower Journal,* Vol. 31, No. 4, pp. 29-44.
16. Tripathy, S. N. (2006), Dynamics of Tribal Migration, Sonali Publications, New Delhi.
17. Yadava, K. N. S. and Singh S. K. (1998), "Population Diversity and Internal Migration:
18. Testing the Lee Theory", *Demography India,* Vol. 17, No. 1, pp. 43-57.
19. Yeshwant, T. S. (1962), "Rural Migration – A Case Study in Four Ramanathapuram Villages", *Agricultural Situation in India,* Vil. 17, No. 6.
20. Zachariah, K. C. (1959), "Migration to Greater Bombay 1941-1951", *The Indian Journal of Social Work,* Vol. 20, No. 3.

A Security System for Paper Currency & Important Papers with RFID

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Abstract

The purpose of this paper is to develop RFID tags without any electronic chips. The significance of this project is vital. This new system can be used to strengthen the security of currency, stamp papers and other important documents to avoid unauthorized copy and fraud can be identified. To achieve this, inks are made of tiny chemical particles reflecting RF, is designed and developed, by usage of a multi-frequency RFID reader that will beam the waves and capture the attenuation from the transponder in the form of analog signals and converted into the digital codes, then compared with a database for authenticity.

Keywords

Paper, Plastic, RFID, Chipless, System.

Introduction

Now these days electronically tracking system are a widely growing field. Optical barcodes has become popular. The barcodes are widespread due to low cost and easy to fabricate. It is impossible to read, if there is any obstruction between the barcode and reader. Readers and tags are limited functionality by their short range of reading. When reading a barcode, barcode reader also causes problem. If the reading device is not properly aligned or is held at an improper angle, the encoded information cannot be read and one human operator is required for that individual reading operation. Another very familiar tracking technique is the magnetic strips, which are widely used in business to perform several identification purposes. Magnetic strips are quite similar to Smart Cards in terms of usage; a card reader is required to read data from these cards. It is why the global cost of this identification technique is high.

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The limitations of barcodes and magnetic strips– costs and not contactless – have prevented their use in a wide range of applications for machine-readable data storage. The above problem may be overcome by reading another technology based on radio waves. Radio frequency identification (RFID) is an automatic technique of capturing information coming from a label containing the data by remote radio reading. The label consists of a microchip and an antenna which ensures the communication with a dedicated reader. Recently, this technology has become inevitable for item identification and tracking applications and also very popular as a device for storing and transmitting information. Most RFID tags present a longer reliable range than barcodes. Progress is slowed down due to several economical, technological and social factors like the size and high cost of the tags, limitation of frequency band, range of reading, mobility of the object, lack of safety and reliability of the information contained within RFID chip, and difficulties in recycling tags [7]. Because applications using RFID present various constraints, each tag design is dedicated for a specific application. And it can be found many variant of RFID depending on several parameters.

The most significant parameters that best describe a RFID tag are the way of empowering, the reading range, the data processing, the read/write capability and the protocol used. For realizing low cost RFID tags, one of the most promising techniques is printable chipless RFID tags [2]. Benefit from the removal of chips, the price of a unit chipless tag is expected to be significantly lower than the chip based tags. Incorporating high- throughput printing techniques and low cost paper substrates, these chipless tags can be massively produced at extremely low expense.

The major change of this technology is the absence of any chip IC connected to antenna. For these reasons, the chipless tags provide a very attractive solution for specific or everyday life applications. The principle of the information encoding, the identification number of the tag, is based on the generation of a specific temporal or frequency footprint. This temporal footprint can be obtained by the generation of echoes due to the reflection of the incidental pulse. In the frequency domain, one can characterize the spectrum of the backscattering pulse.

There have been many researches on RFID in the past but extensive research on this type of RFID has not been done yet to tag documents and large volume of paper/ plastic-based items such as intelligence agency reports, financial securities, postage stamps, banknotes, tickets and envelopes due to the relatively high price of the tag when compared to the price of the tagged item and the presence of an application-specific integrated circuit (ASIC) chip. The chemical mixture can either be embedded or printed and form an invisible binary code in a particular point/ end of that item.

Methodologies

The proposed chipless RFID system will have spectral (frequency) signature-based chipless passive RFID transponders/ tags, so the transponders will not need any power supply for its operation [3]. A system will be developed which will randomly embed tiny fibers (with different chemical composition) in paper or print invisible chemical mixture of "nanometric" materials (tiny particles of chemicals with varying degrees of magnetism) that will resonate when bombarded with electro-magnetic waves from a reader. Each chemical will emit its own distinct radio frequency that will be picked up by the reader, and all frequencies that will be emitted by a specific mix of different chemicals are then interpreted as a binary number. If the system uses up to n different chemicals, each chemical will be assigned its own position in n-digit binary number. For example, the presence of a chemical component is defined by 1 and absence by 0. If chemicals P, Q, R and S are assigned to the first, second, third and fourth positions in the n-digit number, then a mixture consisting of P and R will represent the binary number 1010 followed by (n-4) zeros. Suppose for banknotes, each banknote will possess a unique ID and it will be done by the printer or the manufacturer applying a specific chemical mix corresponding to the ID being printed. Once a banknote's ID code is printed, the system will be able to scan the code from a certain distance, without a line-of-sight requirement.

Thus the chemically embedded tag encodes data in the frequency spectrum hence having a unique binary ID or "spectral signature". The spectral signature is obtained by interrogating the transponder by a multi-frequency signal and observing which

frequencies are attenuated [4]. Depending on the attenuation, an alarm can be generated when bit errors will be detected. RFID reader sends out a multi-frequency interrogation signal which might be higher than the frequencies commonly used by wireless LANs and handheld computers [5]. The receiving and transmitting tag antennas should be cross-polarized to minimize the interference between the interrogating signal and the retransmitted encoded signal of the spectral signature. When someone will bear/submit the paper/plastic based items then the reader will read the RFIDs without being in line-of-sight. Next, the algorithm programmed in a connected computer will compare the embedded ID with the database (kept in the PC). If the any of the IDs does not match with the database then it will give alarm and vice versa. Thus, a system will be able to detect any forgery. The whole process can be showed in following flow chart:

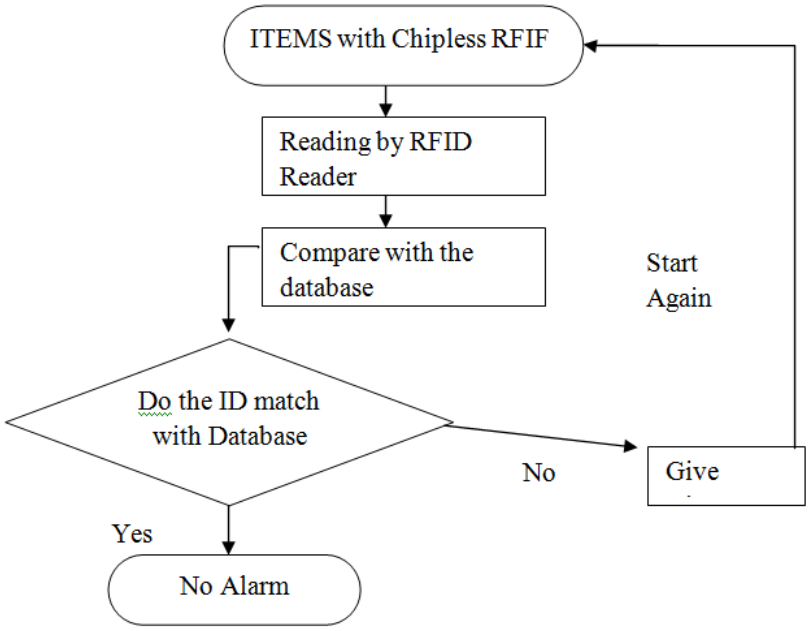

Figure 1: A Security System for paper or plastic based items using chipless RFID

Readers can also be placed inside copy machines to prevent unauthorized copying. One application would be to require that any document printed on such special paper be photocopied onto the same type of paper. That way, an intelligence agency, financial institutions like banks or even a company wanting to protect its intellectual property

from counterfeiting could install readers at building exits to prevent unauthorized people from copying documents and leaving the building with them. One of the big advantages will be that the tag can be printed on just about anything. Therefore, it will not complicate the process of producing the product and the printing can be done in invisible mode for extra security.

Additional work may be concentrated on improving investigators the phase of the received signal encoded by the tag as phase is more resistive to the effects of noise and other interferences.

Predicted Results

The proposed methodology will be applied to any of the paper/ plastic based items, such as any bank notes, low cost and secured paper/ polymer-based items. The project concerns design and implementation of passive devices design, antennas, proper frequency band, analog and digital electronic design, signal processing algorithm, middleware, and finally, implementing them in FPGAs and micro-controllers for the RFID reader. The performance of the proposed methodology will be judged in terms the ability to extract the spectrum phase to decode the transponders' ID and to detect bit errors. If any item gives alarm, repeated examination can be done to ensure whether it is giving false alarms or not. The possible pitfall is, in environments where there are lots of metallic or water-filled objects, however, readers may not be able to scan the codes printed because metal reflects RF signals and water absorbs them, which are also the major constraints for conventional RFID systems.

ANALYSIS

Queuing cost

Queuing system designing usually involves on one or the combination of the following decisions:

- Number of servers

- Servers efficiency

- Number of service facilities

Trade-off decision is the problem in virtually every queuing situation. We have to weigh the added cost of providing rapid service i.e. more checkout counters, service staff, against the inherent cost of waiting. For instance, if employees are doing data entry manually and spending all their time in it, so we would have a process improved by comparing the cost in investing in barcode scanners against benefits of increased productivity. Similarly, if customers are leaving the queues due to insufficient number of customer support employees, we can compare the cost of hiring new personals to the value of increased revenues and maintaining customer loyalty.

Relationship of queuing cost and service capacity can observe initially the cost of waiting in the queue is at a peak position when the service capacity is at minimal. As the service capacity increases, number of customers in the line and their waiting times reduce as well, which overall decreases the queuing cost. Ideally the optimal total cost is found at the intersection between the service capacity and the waiting line curves.

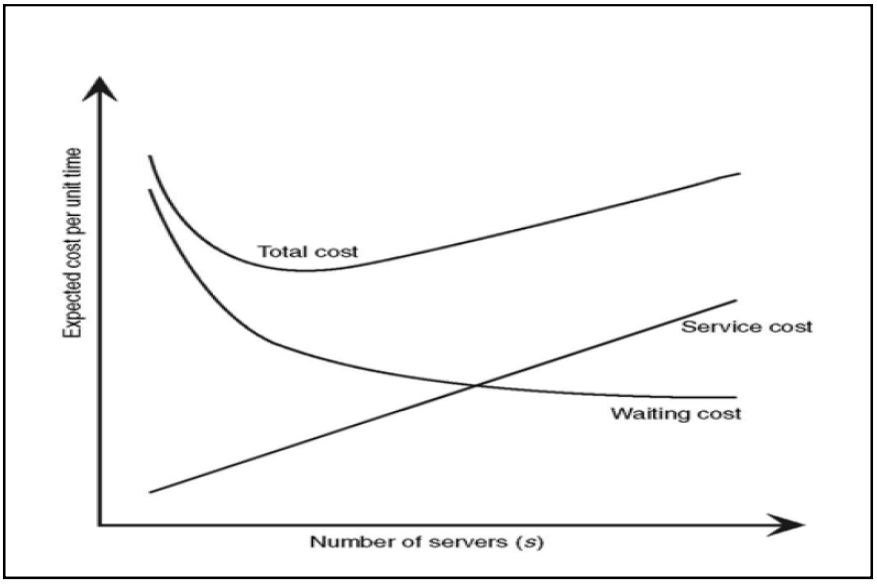

Figure 2 : Graph showing the cost of queuing (Source: Operation research, 2009)

Mathematically the total cost can be calculated by following expression:

E(TC) = E(SC) + E(WC)

Where,

E(SC) is the cost of service

E(WC) is the cost of waiting

Use of Simulation in Queuing Models

It is a method that analyze how system utilize the limited resources to the elements waiting to be served, while waiting elements may show discrete variability in demand, arrival times and processing levels.

Queuing systems with classification of M/M/c structure shows more than one queue or multiple queues providing number of customers in the system and in a queue is finite, for solving those models computation and calculations are difficult. Analytical computation of service rate is very difficult or almost impossible, Monte Carlo simulation is applied to get estimations. " A standard Monte Carlo simulation algorithm fix a regenerative state and generate a sample of regenerative cycles, and then use this sample to construct a likelihood estimator of state" (Nasroallah, 2004).

Factors Affecting the Implementation of RFID

Hamid (2012) sees difficulties in the implementation of RFID technology. He argues that it is difficult to introduce a technology to be used by multiple players, but where should be the major governing. Hamid also believes that value system for packaged foods, as a whole, can benefit from the introduction of RFID, but he does not believe that any individual players will benefit from it. What costs and benefits will be distributed among the various players in the current situation is still unclear. Negotiations and decisions that will clarify this are complex and will be surrounded by problems and policies.

Hamid (2012) also believes that there are those who have knowledge and those who are carrying out tests of RFID technology in the current situation is on power and is better prepared for future negotiations on value distribution. According to A.Altaf (Agility), relations between logistics companies and their customers is characterized largely by long-term partnerships and relationships. For example, they have long-term relationships with their customers as an explicit strategy. Other argues that cooperation may vary based on different clients. Some customers will only see the price and select logistics accordingly. Even the type of goods being transported affect relations. Low-and high-value goods demand various partnerships, where companies with goods (low values) tend to look at the price only and companies with goods (high values) evaluates other phenomena. The relationships may be affected if disagreements arise as to who will bear the costs and who will get the benefits of RFID technology. A.Altaf (Agility) argues that the strongest player in the retail supply chain is the retail stores and agrees that they will have to introduce RFID if their customers have this requirement. However, this will be the subject of agreement. It would be better if the tags applied to the goods early in the chain so that everyone can enjoy the benefits of the technology makes possible.

The two of the retailers we interviewed agreed that they (retailers) are the strongest player in the retail supply chain, but Erfan (Lidl) points out that everyone in the retail supply system influences and argue that providers can set standards and cites Procter & Gamble and Gillette as examples. These are great players and can take advantage of economies of scale.

Emil and Erfan (Willys, Lidl) agreed that the tags should be applied to the products of those who manufacture and supply products. But who will bear the cost of the tags is unclear. The general consensus seems to be that those who apply the tag will bear the cost initially, but this would lead to price increment implemented throughout the entire system to the end consumers who ultimately bear the costs. Jonas (Lidl) argue that cost sharing should be analyzed and those who get the most out of the use of RFID to take the biggest costs.

Analysis of Point of Sales Service

In the sales checkout service has 6 waiting lines in the form of parallel cash counters and customers are served on first in first out (FIFO) basis. The data was collected for two out of six servers. The sales checkout unit has six parallel counters out of which 2 were observed (for each counter there is an individual sale to serve the customers waiting in the queue), it might be possible that some of the checkout units are idle. The collected data was tabulated in a spreadsheet for calculating the required parameters of queuing theory analysis.

Queuing Calculations

We have found the expected queue length by using empirical data. In the store, we have observed the number of customers waiting in a queue, therefore the average of that number in a system is (1+2+3+. . . . . +1+1)/55 = 1.87 or 2 customers per minute on average waiting in a queue in a system within 40 minutes of data collection time.

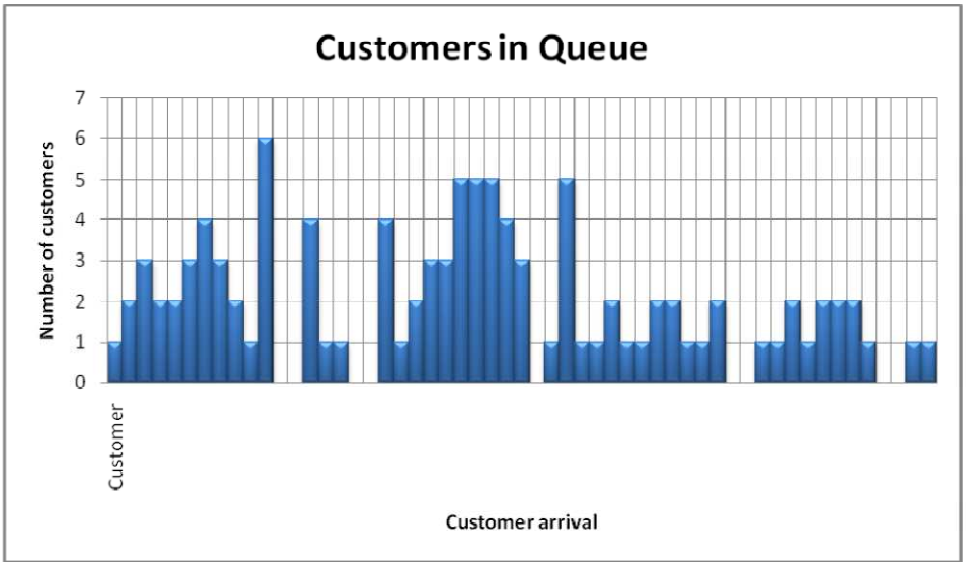

Figure 3 : Customers in Checkout Queue

From the collected data, we have found that customers arrive at an average of 80 per hour, and on an average of 48 customers served per hour by a salesperson.

Results for Queuing model 1

Assuming the steady-state condition, the parameters in Queuing Model M/M/1 are:

Number of servers	C=1
Arrival rate	λ = 40 customers per hour
Service rate	μ = 48 customer per hour per server
System utilization	P = 0.833 or 83.3 %
Probability of server idle	P_0= 0.169 or 16.9%
Average number of customers in the queue	L_q= 4.204 customers
Average waiting time in the queue	W_q= 0.105 hours

Table 1 : Queuing results for Model-1

The sales checkout service performance is sufficiently good; we have observed that server's utilization is .833. Average number of customers waiting in a queue is 4.204 customers. Also the waiting time in a queue is 0.105 hr or 6.307 minutes.

Results for Queuing model 2

Assuming the steady-state condition, the parameters in Queuing Model M/M/2 are:

Number of servers	C=2
Arrival rate	λ = 80 customers per hour
Service rate	μ = 48 customer per hour per server
Service rate for both servers	c μ = 96 customers per hour
System utilization	P = 0.833 or 83.3 %
Probability of all servers	P_0= 0.090 or 9%
Average number of customers in the queue	L_q= 3.730 customers
Average waiting time in the queue	W_q= 0.046 hours

Table 2 : Queuing results for Model-2

The sales checkout service performance is sufficiently good; we have observed that servers‟ utilization is 0.833. Average number of customers waiting in a queue is 3.730 customers per 2 servers. Also the waiting time in a queue is 0.046 hr or 2.76 minutes.

For multi-queue models in closed form it is not possible to obtain solution by solving a set of equations, but they can be obtained easily with simulation methods.

Conclusion

Though this is a theoretical idea, there are few questions that need to be asked like how many chemicals may be used, how the right ones can be chosen and which combinations will give accurate results. Besides ample study should be done to find out the operating frequencies that the reader will use so that the frequencies will not create interference with other existing signals. For a successful operation, a frequency range needs to be specified too. Extreme research can be done to find out the distance from which the system will be able to detect the RFID tags and how this can be increased without compromising the accuracy. Furthermore the sensitivity of the RFID reader needs to be studied and the false alarms should be minimized. This paper doesn't give any solution to find these answers but it is just a mere proposal which can increase the potentiality of using chipless RFID tags in paper or plastic based items to increase its security which might come handy for many countries, agencies and/or personnel.

The main objective of the thesis has been to contribute to the understanding of RFID implementation in the retail supply chain, how it contributes and improves the supply chain, the impact of RFID over the supply chain and about its integration among the different entities of retail supply chain. A theoretical frame work is made so as to have a good understanding about the concepts and research work in the relevant area. The empirical results have been done to examine their work practices within the related field and initiatives.

The results are the following:

With the help of literature and the related work helped us to gain knowledge about various perspectives. The findings are the strong feature of this research work and the knowledge gained through interviews was helpful for a better analysis.

Further Study

Since we had five months for completing our study, if we compare it with the field of RFID we would have need more time to analyze the thorough process of implementing RFID in retail sector. Further proceedings with this thesis work would be analyze the other areas of retail stores as well, such as shelf replenishment and ordering, this further study could encourage the retail stores in the Sweden to focus more and think over implementing RFID and contribute for the cost effectiveness of the process and customer service.

References

[1] Edwards, S. & Fortune, M,. 2008. A Guide to RFID in Libraries, Book Industry Communication.

[2] Eckfeldt, B., 2005. What does RFID do for the consumer? Communication of the ACM Vol.4, Issue: 8, page 77-79.

[3] Ferror, G,. 2009. When is RFID right for your service? International Journal of Production Economics, Volume 124, Issue 2, Pages 414-425.

[4] Gel, Esma. S,. 2010. Analysis of simple inventory control systems with execution errors: Economic impact under correction opportunities. International Journal of Production Economics, Vol.125, Issue.1, pages 153-166.

[5] Givens, B,. 2004. Radio Frequency Identification: Applications and Implications for Consumers. Testimony of Beth Givens, Director to the Federal Trade Commission‟s RFID Workshop, 21 June 2004.

[6] Gray, Richard., 2009. Top 10 Inventions that changed the world. [Online] Available at: http://e- maqzine.blogspot.se/2010/08/top-10-inventions-that-changed-world.html [Accessed 28 June 2016]

[7] Gruen, W., Corsten, S. & Bharadwaj, S,. 2002. Retail Out of Stocks: A Worldwide Examination of Extent, Causes and Consumer Responses. University of Colorado, Research Study, Executive Summary, Version 6.4. [Online] Available at: http://knowledge.emory.edu/papers/1030.pdf [Accessed 15 July 2016]

[8] Hart, S., 1998. Doing a literature review: Releasing the social science research imagination. London, UK: SAGE Publications.

[9] S. Preradovic and N.C. Karmakar. Low Cost Chipless RFID Systems, Multiresonator-Based Chipless RFID: Barcode of the Future, DOI 10.1007/978-1-4614-2095-8_2, © Springer Science+Business Media, LLC 2012

[10] Preradovic, S., Balbin, I., Karmakar, N. & Swiegers, G. F. (2009). Multiresonator-based Chipless RFID System for Low-Cost Item Tracking. IEEE Transactions on Microwave Theory and Techniques, 57 (5), 1411-1419.

[11] Stevan Preradovic and Nemai Karmakar (2011). Fully Printable Chipless RFID Tag, Advanced Radio frequency Identification Design and Applications, Dr Stevan Preradovic (Ed.), ISBN: 978-953-307-168-8.

[12] Stevan Preradovic, Isaac Balbin, Nemai C. Karmakar and Gerry Swiegers. Novel Chipless RFID System Based on Planar Multiresonators for Barcode Replacement. IEEE International Conference on RFID, USA (2016)

[13] M. El-Hadidy, A. Fawky, B. Nagy, M. Khaliel, E. Abdallah, H. Elhennawy, and T. Kaiser. Evaluation of UWB Chipless RFID System Performance Considering Indoor Multipath Propagation Channel and Real World Aspects. PIERS Proceedings, Stockholm, Sweden, (2013)

Emerging trends in the discipline of Nanobiotechnology

Pooja Gupta[1]

Abstract

Nanotechnology refers to an emerging field of science that includes synthesis and development of various nanomaterials. Nanoparticles can be synthesized chemically or biologically. Recently, the use of microorganisms to synthesize functional nanoparticles has been of great interest. The development of eco-friendly technologies in material synthesis is of considerable importance to expand their biological applications. This review paper proposes the synthesis of nanoparticles from microbes and its applications. Several microorganisms like E. coli, Lactobacillus, Pseudomonas, etc. are involved in the nanoparticles synthesis such as gold, silver, titanium, etc. This is a part of the microbes' internal metabolism. The microorganism used for this research is E. coli. The paper has focused the use of silver nanoparticles generated from this microbe.

Keywords

E. coli; Silver nanoparticles; MIC (Minimum Inhibitory Concentration)

Introduction

Nanobiotechnology, bionanotechnology, and nanobiology are terms that refer to the intersection of nanotechnology and biology. The subject is one that has only emerged very recently, bionanotechnology and nanobiotechnology serve as blanket terms for various related technologies.Concepts that are enhanced through nanobiology include: nanodevices (such as biological machines), nanoparticles, and nanoscale phenomena that occurs within the discipline of nanotechnology. This technical approach to biology allows scientists to imagine and create systems that can be used for biological research. Biologically inspired nanotechnology uses biological systems as the inspirations for technologies not yet created.

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Nanotechnology refers to an emerging field of science that includes synthesis and development of various nanomaterials. Nanoparticles—particles having one or more dimensions of the order of 100 nm or less—have attracted great attention due to their unusual and fascinating properties, and applications advantageous over their bulk counterparts. There are a large number of physical, chemical, biological, and hybrid methods available to synthesize different types of nanoparticles. Although physical and chemical methods are more popular in the synthesis of nanoparticles, the use of toxic chemicals greatly limits their biomedical applications. Therefore, development of reliable, nontoxic, and eco-friendly methods for synthesis of nanoparticles is of utmost importance to expand their biomedical applications. One of the options to achieve this goal is to use microorganisms to synthesize nanoparticles.

Recently, the use of microorganisms to synthesize functional nanoparticles has been of great interest. Microorganisms can change the oxidation state of metals. These microbial processes have opened up new opportunities for us to explore novel applications, for example, the biosynthesis of metal nanomaterials. In contrast to chemical and physical methods, microbial processes for synthesizing nanomaterials can be achieved in aqueous phase under gentle and environmentally benign conditions. This approach has become an attractive focus in current green bionanotechnology research towards sustainable development [12].

Review

Synthesis of Silver nanoparticles by microbes is due to their defense mechanism (resistance mechanism), and this is how the nanoparticles produced are useful to us. The resistance caused by the bacterial cell for silver ions in the environment is responsible for its nanoparticles synthesis. The silver ions in nature are highly toxic for the bacterial cells. So their cellular machinery helps in the conversion of reactive silver ions into stable silver atoms. Also, temperature and pH plays an important role in their production. At room temperature, the size of nanoparticles is 50 nm; at higher temperature, i.e. at 60°C, the size of nanoparticles reduces to 15 nm.

This indicates that with the increase in temperature size decreases. Under alkaline conditions, nanoparticles synthesis by the microbe is more as compared to the acidic conditions. But, after pH 10 cell deaths occur. The first evidence of the synthesis comes from Pseudomonas stutzeri AG259, a bacterial strain that was originally isolated from silver mine.The nanoparticles synthesis from E. coli varies with the change in AgNO3 concentration. 1mM concentration is the patented one. Silver when in lower concentration helps in inducing the organism to synthesize nanoparticles, whereas at higher concentration induces cell death.

The production of various nanoparticles via biological methods following the categories of metallic nanoparticles including gold, silver, alloy and other metal nanoparticles, oxide nanoparticles consisting of magnetic and nonmagnetic oxide nanoparticles, sulfide nanoparticles, and other miscellaneous nanoparticles.

Gold Nanoparticles. Gold nanoparticles (AuNPs) have a rich history in chemistry, dating back to ancient Roman times where they were used to stain glasses for decorative purposes. AuNPs were already used for curing various diseases centuries ago. The modern era of AuNPs synthesis began over 150 years ago with the work of Michael Faraday, who was possibly the first to observe that colloidal gold solutions have properties that differ from bulk gold [18].

Biosynthesis of nanoparticles as an emerging bionanotechnology (the intersection of nanotechnology and biotechnology) has received considerable attention due to a growing need to develop environment-friendly technologies in materials synthesis. Sastry and coworkers have reported the extracellular synthesis of gold nanoparticles by fungus *Fusarium oxysporum* and actinomycete *Thermomonospora* sp., respectively. They reported the intracellular synthesis of gold nanoparticles by fungus *Verticillium* sp. as well. Southam and Beveridge have demonstrated that gold particles of nanoscale dimensions may readily be precipitated within bacterial cells by incubation of the cells with Au3+ ions.

Silver Nanoparticles. Silver nanoparticles, like their bulk counterpart, show effective antimicrobial activity against Gram-positive and Gram-negative bacteria, including highly multiresistant strains such as methicillinresistant *Staphylococcus aureus.* The secrets discovered from nature have led to the development of biomimetic approaches to the growth of advanced nanomaterials. Recently, scientists have made efforts to make use of microorganisms as possible eco-friendly nanofactories for the synthesis of silver nanoparticles.

Various microbes are known to reduce the Ag+ ions to form silver nanoparticles, most of which are found to be spherical particles. Klaus and coworkers have shown that the bacterium *Pseudomonas stutzeri* AG259, isolated from a silver mine, when placed in a concentrated aqueous solution of silver nitrate, played a major role in the reduction of the Ag+ ions and the formation of silver nanoparticles (AgNPs) of well-defined size and distinct topography within the periplasmic space of the bacteria. AgNPs were synthesized in the form of a film or produced in solution or accumulated on the surface of its cell when fungi, *Verticillium*, *Fusarium oxysporum*, or *Aspergillus flavus,* were employed.

Alloy Nanoparticles. Alloy nanoparticles are of great interest due to their applications in catalysis, electronics, as optical materials, and coatings. Senapati et al. reported the synthesis of bimetallic Au-Ag alloy by *F.oxysporum* and argued that the secreted cofactor NADH plays an important role in determining the composition of Au-Ag alloy nanoparticles. Zheng et al. studied Au-Ag alloy nanoparticles biosynthesized by yeast cells. Fluorescence microscopic and transmission electron microscopic characterizations indicated that the Au-Ag alloy nanoparticles were mainly synthesized via an extracellular approach and generally existed in the form of irregular polygonal nanoparticles.

Other Metallic Nanoparticles. Heavy metals are known to be toxic to microorganism life. In nature, microbial resistance to most toxic heavy metals is due to their chemical detoxification as well as due to energy-dependent ion efflux from the cell by membrane

proteins that function either as ATPase or as chemiosmotic cation or proton antitransporters. Alteration in solubility also plays a role in microbial resistance. Konishi and coworkers reported that platinum nanoparticles were achieved using the metal ion-reducing bacterium *Shewanella algae.* Resting cells of *S. algae* were able to reduce aqueous $PtCl_6^{2-}$ ions into elemental platinum at room temperature and neutral pH within 60min when lactate was provided as the electron donor. Platinum nanoparticles of about 5 nm were located in the periplasm. Sinha and Khare demonstrated that mercury nanoparticles can be synthesized by *Enterobacter* sp. cells.

Magnetic Nanoparticles. Magnetic nanoparticles are recently developed new materials, due to their unique microconfiguration and properties like super paramagnetic and high coercive force, and their prospect for broad applications in biological separation and biomedicine fields. Magnetic nanoparticles like Fe_3O_4 (magnetite) and Fe_2O_3 (maghemite) are known to be biocompatible. They have been actively investigated for targeted cancer treatment (magnetic hyperthermia), stem cell sorting and manipulation, guided drug delivery, gene therapy, DNA analysis, and magnetic resonance imaging (MRI). Magnetotactic bacteria synthesize intracellular magnetic particles comprising iron oxide, iron sulfides, or both.

Non-magnetic Oxide Nanoparticles. Beside magnetic oxide nanoparticles, other oxide nanoparticles have also been studied including TiO_2,Sb_2O_3, SiO_2, $BaTiO_3$, and ZrO_2 nanoparticles. Jha and co-workers found a green low-cost and reproducible *Saccharomyces cerevisiae* mediated biosynthesis of Sb_2O_3 nanoparticles. Analysis indicated that Sb_2O_3 nanoparticles unit was a spherical aggregate having a size of 2–10nm. Bansal et al. used *F. oxysporum* (Fungus) to produce SiO_2 and TiO_2 nanoparticles from aqueous anionic complexes SiF_6^{2-} and TiF_6^{2-}, respectively. They also prepared tetragonal $BaTiO_3$ and quasispherical ZrO_2 nanoparticles from *F. oxysporum* with a size range of 4-5nm and 3–11 nm, respectively.

Sulfide Nanoparticles. In addition to oxide nanoparticles, sulfide nanoparticles have also attracted great attention in both fundamental research and technical applications as

quantum-dot fluorescent biomarkers and cell labeling agents because of their interesting and novel electronic and optical properties. CdS nanocrystal is one typisulfide nanoparticle and has been synthesized by microorganisms. Cunningham and Lundie found that *Clostridium thermoaceticum* could precipitate CdS on the cell surface as well as in the medium from CdCl2 in the presence of cysteine hydrochloride in the growth medium where cysteine most probably acts as the source of sulfide. *Klebsiella pneumoniae* exposed to Cd2+ ions in the growth medium were found to form 20–200nm CdS on the cell surface. Intracellular CdS nanocrystals, composed of a wurtzite crystal phase, are formed when *Escherichia coli* is incubated with CdCl2 and Na2SO4.

Other Nanoparticles. In biological systems, a large variety of organisms form organic/inorganic composites with ordered structures by the use of biopolymers such as protein and microbe cells. SrCO3 crystals were obtained when challenging fungi were incubated with aqueous Sr2+ions. The authors believed that secretion of proteins during growth of the fungus *Fusarium oxysporum* is responsible for modulating the morphology of strontianite crystals and directing their hierarchical assembly into higherorder superstructures. Zinc phosphate nanopowders were synthesized with yeasts as biotemplates. Yan et al. demonstrated the synthesis of Zn3(PO4)2 powders with butterfly-like microstructure with a size range of 10–80nm in width and 80–200nm in length. Kumar et al. showed that highly luminescent CdSe quantum dots can be synthesized by *F. oxysporum* at room temperature[13].

Material and methods:-

The test material is E.coli microorganism, nutrient broth, silver nitrate etc.

Figure 1: Microbe synthesized silver nanoparticles.

The nanoparticles can be artificially synthesized in vitro using chemical method via ethanol. But, here the synthesis was done through E. coli under room temperature. The supernatant was taken from the nutrient broth, incubated overnight inoculated with E. coli. Then 1 mM of AgNO3 (1% v/v) was added to the supernatant. The formation of silver nanoparticles was observed within 10 minutes. The color change was noticed from fine yellow color to reddish brown with time, as shown in figure 2.

Antibacterial Effect

After keeping for a long time, there was a transition of color change (Figure 3), from fine yellow to deep reddish brown. We took four different series of color change namely, "**fine yellow**" as **delta (δ);** "**light brown"** as **gamma (γ); "light reddish brown"** as **beta (β);** and **"deep reddish brown"** as **alpha (α).** Alpha consisted of maximum nanoparticles concentration. **Beta** consisted of lesser no. of nanoparticles as compared to **alpha**. Gamma consisted of less nanoparticles concentration than beta. **Delta** consisted of least nanoparticle concentration of the all.

Alpha (α), reddish brown color-showed the maximum inhibition with no growth in its zone.
Delta (δ), fine yellow color–showed the minimum inhibition of growth.

Figure 2: The change in color due to the microbial synthesis of silver nanoparticles with time–from fine yellow to reddish brown

Therefore, one can conclude that with time nanoparticles production from E. coli increases and hence, their antibacterial property varies accordingly. The intensity of color is directly proportional to nanoparticles production.

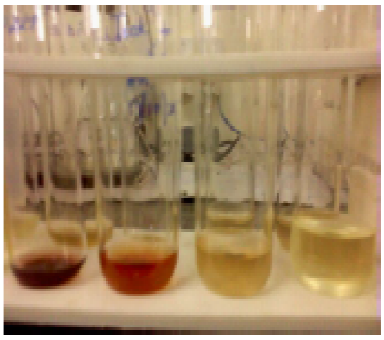

Figure 3: The picture shows Alpha, Beta, Gamma and Delta samples starting from the left.

To prove their efficacy, their zone of inhibition (MIC) was tested against E. coli. And for these, wells were created in a petri plate spread with micro diluted culture (25 µl). The created wells were filled with α, β, γ and δ samples, 50 µl each (Figure 4). **Alpha (α)**, reddish brown color-showed the maximum inhibition, with no growth in its zone. **Delta (δ)**, fine yellow color–showed the minimum inhibition of growth. Alpha and beta showing the maximum inhibition.

Water treatment

The colloidal solution of silver nanoparticles was taken to check its efficacy in water

Alpha and beta showing the maximum inhibition.

Figure 4: The above picture shows the MIC of the *E. coli*, when tested against alpha, beta, gamma and delta samples.

treatment. For this, 12 gm of stones were dipped in the colloidal solution for 10 min. They were then heat dried in microwave oven at 60°C for 10 min. Then the stones were

again dipped in 10^{-5} solution of E. coli-25 µl of the solution was then spread onto the agar petriplate. It was kept for overnight incubation [12].

Result

The plate contained no colonies (Figure 5), proving that the microbe generated silver nanoparticles can be effectively used in water treatment, as well where stones can be used in the form of a filter, through which water when passed, can be purified. And also the reusability of the stones showed no growth under lab conditions.

Figure 5: The picture above shows the effect of Silver nano against the control showing no colonies, proving their antibacterial properties.

Discussion

In this study, biological synthesis of silver nanopartical are showed. Now nanomedicine has tremendous prospects for the improvement of the diagnosis and treatment of human disease. Use of microbes in biosynthesis of nanoparticles is an environmentally acceptable procedure.

However, much work is needed to improve the synthesis efficiency and the control of particle size and morphology. It is know that the synthesis of nanoparticles using microorganism is a quite slow process (several hours and even a few days) compared to physical and chemical approaches. Several studies have shown that the nanoparticle formed by microorganism may be decomposed after a certain period of time.

Thus, the stability of nanoparticles produced by biological methods deserves further study and should be enhanced. Research is currently carried out manipulating cells at the genomic and proteomic levels. With a better understanding of the synthesis mechanism

on a cellular and molecular level, including isolation and identification of the compounds responsible for the reduction of nanoparticles, it is expected that short reaction time and high synthesis efficiency can be obtained.

Conclusion

There are a large number of physical, chemical, biological methods available to synthesize different types of nanoparticles. Although physical and chemical methods are more popular in the synthesis of nanoparticles, the use of toxic chemicals greatly limits their biomedical applications, in particular in clinical fields. Therefore, development of reliable, nontoxic, and eco-friendly methods for synthesis of nanoparticles is of utmost importance to expand their biomedical applications. One of the options to achieve this goal is to use microorganisms to synthesize nanoparticles. The biosynthesis of nanoparticles by microbes is thought to be clean, nontoxic, and environmentally acceptable “green chemistry” procedures. The use of microorganism including bacteria, yeast, fungi, and actinomycetes can be classified into intracellular and extracellular synthesis according to the location where nanoparticle are formed. Nanoparticles are different type use in various medical and other fields.

Reference

1. Ehud Gazit, Plenty of room for biology at the bottom: An introduction to bionanotechnology. Imperial College Press, 2007, *"Nanobiology". Nanotech-Now.com.*
2. Dubchak S., Ogar A., Mietelski J.W. and Turnau K.,Influence of silver and tianium nanoparticles on arbuscular mycorhiza colonization and acumulation of radiocaesium in Helianthus anus, *Span. J. Agric. Res.*, 8(1), 103-108,(2010)
3. M. C. Daniel and D. Astruc, “Gold nanoparticles: assembly, supramolecular chemistry, quantum-size-related properties, and applications toward biology, catalysis, and nanotechnology,” Chemical Reviews, vol. 104, no. 1, pp. 293–346, 2004.

4. H. Kato, “In vitro assays: tracking nanoparticles inside cells,” Nature Nanotechnology, vol. 6, no. 3, pp. 139–140, 2011.
5. J. Liu, S. Z. Qiao, Q. H. Hu, and G. Q. Lu, “Magnetic nanocomposites with mesoporous structures: synthesis and applications,” Small, vol. 7, no. 4, pp. 425–443, 2011.
6. N. A. Luechinger, R. N. Grass, E. K. Athanassiou, and W. J. Stark, “Bottom-up fabrication of metal/metal nanocomposites from nanoparticles of immiscible metals,” Chemistry of Materials, vol. 22, no. 1, pp. 155–160, 2010.
7. D. K. Tiwari, J. Behari, and P. Sen, “Time and dose-dependent antimicrobial potential of Ag nanoparticles synthesized by top-down approach,” Current Science, vol. 95, no. 5, pp. 647–655, 2008.
8. P. Mohanpuria, N. K. Rana, and S. K. Yadav, “Biosynthesis of nanoparticles: technological concepts and future applications,” Journal of Nanoparticle Research, vol. 10, no. 3, pp. 507–517, 2008.
9. R. Bhattacharya and P. Mukherjee, “Biological properties of “naked” metal nanoparticles,” Advanced Drug Delivery Reviews, vol. 60, no. 11, pp. 1289–1306, 2008.
10. K. Simkiss and K. M. Wilbur, Biomineralization, Academic, New York, NY, USA, 1989.
11. Microbial Synthesis of Silver Nanoparticles: A Review Vibha Saklani*, Suman and V.K. Jain Amity Institute of Advanced Research and Studies (Materials and Devices), Amity University, Noida, India.
12. *Review Article* Biosynthesis of Nanoparticles by Microorganisms and Their Applications Xiangqian Li,1, 2 Huizhong 1Xu,3 Zhe-Sheng Chen,2 and Guofang Chen4.

A Review Article on Advances in Stem Cell Cultures in Animal Biotechnology (with Reference to Ovarian Cancer)

Reacha Shriwas[1]

Abstract

Stem cells are mother of the all cells which have three general properties: i) they are capable of dividing and renewing themselves for long periods; ii) they are unspecialized; and iii) they can give rise to specialized cell types. It develops in three lines, namely lymphoid lineage, myeloid lineage and erythroid lineage. It can be divided into main three categories: embryonic, germinal, and somatic.It'simmense for curing Alzheimer's disease, repairing damaged spinal cords, treating kidney, liver and lung diseases and making damaged hearts whole etc. Now recently it is mainly uses in treatment of ovarian cancer and getting many researches in this field. There are developing models for ovarian cancer and therapies are developed. Ovarian cancer is a highly lethal disease among all gynecologic malignancies in women, in which epithelial ovarian carcinoma (EOC) is the major form of the disease and accounts for about 90% of ovarian tumors. The combination of surgery and platinum-based chemotherapy was the standard treatment for ovarian cancer but now immunotherapy based on stem cell therapy is in trial zone and some result got success. Many diseases have cured by stem cell culture therapy and some in clinical trial.

Keywords

ESCs, EOC, Self renewal, Xenogeneic, Overwhelmingly, SCNT, HDC, Paclitaxel, Carboplatin, EpCAM, Nanoscale.

Introduction

Stem cell is mother of all cells which have self-renewal capacity with highly replicative potential in multilineage differentiation capacity. Use of stem cells in immuno-modulation or reconstitution is one of the methods used for decades in cancer therapy.

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Stem cell develops in three lines, namely lymphoid lineage, myeloid lineage and erythroid lineage. Stem cells can be divided into main three categories: embryonic, germinal, and somatic. Embryonic stem cells would be the source of stem cells for therapeutic purposes due to higher totipotency and indefinite life span compared to Adult stem cells with lower totipotency and restricted life span.

Recent advances in the understanding of pluripotent stem cell biology and emerging technologies to reprogram somatic cells to a stem cell-like state which helping bring stem cell therapies for human disorders closer to clinical reality. Human pluripotent stem cells (hPSCs) have become a promising resource for regenerative medicine and research into early development because these cells are able to self-renew indefinitely and are capable of differentiation into specialized cell types of all. A major limitation for successful therapeutic application of human pluripotent stem cells and their derivatives is the potential xenogeneic contamination and instability of current culture conditions. It is immense hope for curing many disease.Now recently it is mainly uses in treatment of ovarian cancer and getting many researches in this field.

Ovaries are reproductive glands found only females, which produces eggs (ova) for reproduction and also main source of the female hormones estrogen and progesterone. Ovarian cancer is a heterogeneous disease begins in the ovaries, Based on different histological features, most tumors of the ovary contain three major types of cells: surface epithelial cells, stromal cells (including granulose, theca, and hilus cells), and germ cells (oocytes). Ovarian cancer is a highly lethal disease among all gynecologic malignancies and is the fifth leading cause of cancer-related death in women. Epithelial ovarian carcinoma (EOC) is the major form of the disease and accounts for about 90% of ovarian tumors. The most important risk factor for ovarian cancer is a family history, mutation in BRCA1 or BRCA2 gene. Three distinct hereditary syndromes associated with the occurrence of familial ovarian cancer have been identified: (i) ovarian cancer syndrome, (ii) hereditary breast-ovarian cancer syndrome, and (iii) Lynch II syndrome.

The combination of surgery and platinum-based chemotherapy was the standard treatment for advanced ovarian cancer.

Disease treated with stem cells and its potential application

Blood cancer, Solid tumors, Non malignant blood disorders, Immune disorders such as SCID, Metabolic disorders etc.

Clinical trials

Alzheimer disease, Kidney plus stem cell transplant, Graft versus host disease, brain tumors, Liver cirrhosis, Rheumatoid arthritis, Crohn's diseases, Myocardial infarction, Huntington's disease, Diabetes type 1, Ovarian cancer, Spinal cord injury, Ewing sarcoma, Parkinson's disease, Testicular tumors.

Review of literature

Stem cells have the remarkable potential to develop into many different cell types, essentially without limit to replenish other cells as long as the person or animal is still alive, offering immense hope of curing many diseases. Scientists primarily worked with two kinds of stem cells from animals and humans: embryonic stem cells and non-embryonic "somatic" or "adult" stem cells. Recent breakthrough makes it possible to "reprogram" specialized adult cells to assume stem cells. To circumvent this limitation, an existing laboratory technique was revived for creating a blastula with the transfer of a donor nucleus to a denucleated egg (Gurdon, 1962; McGrath and Solter, 1983), laterally called (SCNT) somatic cell nucleated transfer.All stem cells have 3 general properties.

First-line treatment for ovarian cancer includes surgery followed by a chemotherapy regimen combining a platinum-based (usually carboplatin) and a taxane-based (usually paclitaxel) treatment, which achieves a complete response in approximately 80% of patients. Therefore, patients with platinum-resistant disease are encouraged to enter clinical trials. In this therapeutic process many enzymes and molecules are used as marker or drug molecules.

Multiple uncontrolled studies have examined the effectiveness of single and multiple cycles of high-dose chemotherapy (HDC) of paclitaxel/platinum combination with stem

cell support (peripheral stem cells or autologous bone marrow transplantation) in patients. High-dose chemotherapy with autologous stem cell transplantation is still investigational for patients with epithelial ovarian cancer. Different conclusion given by different scientist like limited result, effective etc. Current immune therapies for ovarian cancer fall into six broad categories: monoclonal antibodies; checkpoint inhibitors and immune modulators; therapeutic vaccines; adoptive T cell transfer; oncolytic viruses; and adjuvant immune therapies. Most of these therapies are still in early-phase testing (phase I and II) for ovarian cancer, but their successful use in other types or ovarian cancer as well and get successful result also.

Materials and Methods

EQUIPMENT REQUIRED FOR CELL CULTURE = Laminar air flow hoods, CO2 incubator, vessels, microscope, centrifuge, freeze.

SUBSTRATE =There are numerous types of vertebrate cell (stem cell) that have need of support for their development *in vitro.* Enlargement (e.g. glass, palladium, metallic surfaces), non- adhesive (e.g. agar, agarose, etc.).

MEDIA = Natural Media (Clots, Biological fluids, Tissue extracts.), Artificial Media (Serum containing media, Serum free media, chemically defined media, Protein free media)

CULTURE ENVIRONMENT =

- pH [acidic environments (pH 7.0 - 7.4), basic environments (pH 7.4 - 7.7)]
- CO2 [Most researchers usually use 5% - 7% CO2 in air; 4% - 10% CO2 is common for most cell culture experiments. CO2 tension and bicarbonate concentration to achieve the correct pH and osmolality]

- TEMPERATURE **=** majority human and mammalian cell lines are main- tainted at 36°C to 37°C for optimal growth. Cold-blooded animals (e.g.amphibians, cold-water fish) bear an extensive temperature vary between 15°C and 26°C.

Surgery-

Surgery is the initial modality of treatment for stage I-IVA epithelial ovarian cancer. However, only a small percentage of women with epithelial ovarian cancer can be treated with surgery alone. This small percentage includes patients with stage IA or IB (grade 1) serous, mucinous, endometrioid, and Brenner tumors. Treatment of grade 2 tumors remains controversial.

Chemotherapy – chemotherapy is the use of drugs to treat cancer. Chemo is a systemic treatment − the drugs are enter the bloodstream and reach all areas of the body. Systemic chemo uses drugs that are injected into a vein (IV) or given by mouth or catheter (thin tube) directly into the abdominal cavity (For some cases of ovarian cancer), known as "intra peritoneal (IP) chemotherapy". Chemotherapy recommendations based on stage.

The standard approach is the combination of a platinum compound, such as cisplatin or carboplatin, and a taxane, such as paclitaxel (Taxol®) or docetaxel (Taxotere®). For IV chemotherapy, most doctors favor carboplatin over cisplatin because it has fewer side effects and is just as effective.

Some Side effects are also observed, including Nausea and vomiting, Loss of appetite, Loss of hair, Increased chance of Bleeding or bruising after minor cuts or injuries, Fatigue. Most side effects disappear once treatment is stopped. There are remedies for many of the temporary side effects of chemotherapy. Some chemo drugs may have long-term or even permanent side effects. For example: kidney damage, nerve damage (neuropathy) etc.

Treatment of Ovarian Cancer with Stem Cell Culture Therapy

1. Cell Surface and Nonsurface Markers = Cell surface markers (i.e., CD molecules, short for cluster of differentiation) have been widely used to isolate putative CSCs through flow cytometry. Most types of CSCs share the identical biomarkers, including ovarian cancer stem cells. To activate the immune system to clear cancer cells in patient body, antibody-based therapy for cancer has been developed for decades. Moreover, the strategy of antibody-drug conjugates has achieved considerable success in recent years. Indeed, development of specific therapies that target biomarkers of ovarian CSCs could improve clinical outcome and patient's survival. [4]

CD133=CD133, a transmembrane glycoprotein, is one of the most widely described ovarian CSCs markers. Its expression level is higher in advanced serous ovarian cancer than that in normal ovaries and benign tumors. Tumor cells carrying CD133 marker (often abbreviated as $CD133^{+}$) displayed greater resistance to chemotherapy. In addition, $CD133^{+}$ ovarian CSCs have hyperactivity in migration and invasion due to the activation of chemokine (c-c motif) ligand 5 (CCL5).

CD44=CD44, another CSC surface transmembrane glycoprotein, is a receptor for hyaluronic acid (HA) involved in cell-cell and cell-matrix interactions. It will ultimately affect cellular growth, differentiation, and motility. CD44 is highly expressed in many types of cancer, including ovarian CSCs.

CD24=CD24 is a glycosylphosphatidylinositol-linked cell surface protein expressed in various solid tumors. Expression of CD24 affected metastasis and represented poor prognosis in ovarian cancer. The cytoplasmic expression of CD24 could be used as a specific marker to predict the survival rates and recurrence of cancer. CD24 inhibition may be considered as an effective approach for cancer therapy.

CD117=CD117, known as c-kit, is a type III receptor tyrosine kinase involved in cell signal transduction. It involved in various cellular processes. A potent CD117 specific inhibitor

has been used in the clinical trials for the treatment of many types of cancer, including persistent epithelial ovarian cancer.

EpCAM=The epithelial cell adhesion molecule EpCAM is a glycosylated membrane protein. It is highly expressed in different tumor types, including colon, lung, pancreas, breast, head and neck, and ovary. EpCAM is comprised of an extracellular domain (EpEX), a single transmembrane domain and a short 26-amino acid intracellular domain (EpICD). EpCAM positive cells also have tumor-initiating potential. Catumaxomab, a monoclonal antibody against EpCAM is a trifunctional antibody, which can bind tumor cells, T cells, and accessory cells (dendritic cell, macrophages, and natural killer cells. Based on both preclinical and clinical outcomes, EpCAM may be served as a possible therapeutic target against epithelial ovarian cancer.

Aldehyde Dehydrogenase (ALDH) Isozymes=ALDH proteins are a superfamily containing 19 enzymes that protect cells from carcinogenic aldehydes. ALDH1A1 was identified as a putative cancer stem cell marker, and it was associated with chemo resistance in the ovarian CSC. Besides ALDH1A1, other ALDH isozymes such as ALDH1A3, ALDH3A2, and ALDH7A1 also had high expression level in ovarian tumors when compared to normal ovarian tissues. These ALDH can be used as a reliable marker to study ovarian cancer stem cells. Other two stem cell markers, Lin28 and Oct4, are also served as new molecular targets. Recently, clinical trials have been initiated using disulfiram (an ALDH inhibitor).

1. Differentiation of Ovarian CSCs = Current methods to eliminate CSCs cannot be successfully applied in all clinical situations. One way to eradicate CSCs is to induce their differentiation, resulting in loss of their stem cell property. Thus, the understanding of regulation of differentiation processes is necessary for designing new agents to eliminate CSCs. In 2012, Yin and his colleagues observed that TWIST-1 (a basic helix-loop-helix transcription factor) played a key role in triggering differentiation of epithelial ovarian cancer (EOC). Whitworth and his colleagues

effectively reduced the growth of ovarian CSC via a drug (Carboplatin) combined with three novel retinoid compounds.

2. Niches of CSCs = Niches are microenvironments where CSCs reside, containing cell-cell, cell-extracellular matrix, and soluble factors that support the growth, progression, and metastasis of CSCs. Indeed, disrupting components in the niches for eradication CSCs in the future, may yield better outcomes without non cytotoxic effect, when compared with that of removing the CSCs.

3. MicroRNAs (miRNAs) **=** MiRNAs are a group of small noncoding RNAs with 20–28 nucleotides in length. They could regulate gene expression at posttranscriptional level. miRNAs are involved in diverse biological processes, such as development and tumorigenesis. Some miRNAs own oncogenic property, such as miR-125, miR-9, miR-30, miR-21, and miR-215. miRNAs should become a potential target for ovarian cancer treatment.

5. Immunotherapy **=** There are 6 categories of treatment.

i) Monoclonal antibody- Monoclonal antibodies is molecules, generated in the lab, that target specific antigens on tumors. Bevacizumab (Avastin®), which targets vascular endothelial growth factor (VEGF), is FDA-approved for the treatment of ovarian cancer. Several monoclonal antibodies are currently being tested in clinical trials; such as farletuzumab, mirvetuximab soravtansine, IMMU-132.

ii) Check points inhibitors and immune modulators - Treatments work by targeting molecules that serve as checks and balances in the regulation of immune responses. By blocking inhibitory molecules or, alternatively, activating stimulatory molecules. Such as pembrolizumab, durvalumab, nivolumab.

iii) Therapeutic vaccine - Several studies of antigen-based vaccines are currently recruiting patients with ovarian cancer, including gemogenovatucel-T, TroVax® (MVA-5T4), p53 vaccine etc.

iv) Adoptive cell transfer - Immune cells are removed from a patient, genetically modified or treated with chemicals to enhance their activity, and then re-introduced into the patient with the goal of improving the immune system's anti-cancer response.

v) Oncolytic viruses - Oncolytic virus therapy uses a modified virus that can cause tumor cells to self-destruct and generate a greater immune response against the cancer. measles virus genetically enhanced to express the thyroidal sodium symporter gene (MV-NIS) in patients with ovarian, fallopian tube, or peritoneal cancer.

vi) Adjuvant immunotherapy - Adjuvant immunotherapies are substances that are either used alone or combined with other immunotherapies to boost the immune response. Eg. epacadostat

Result – By this treatment method successful result observed in which check point inhibitor immunotherapy after chemotherapy was applied and it is boosting the immune system for fighting against cancer and also treat effectively any human cancer. Now finally the patient is cancer free and still alive.

Discussion

Stem cells have potential capacity of self renew and indefinite differentiation that's why it is used in curing many diseases in which some are cured and some in trials. The stem cell therapy puts into the use the cell of the patient's own body and hence the risk of rejection can be reduced because the cell belongs to the same human body. If the cells used in therapy are embryonic then the disadvantage is that the cell will not be from the same human body and there are chances of rejection. A higher understanding will allow the treatment of the abnormal development in the human body.

First-line treatment for ovarian cancer includes surgery followed by a chemotherapy regimen combining a platinum-based (usually carboplatin) and a taxane-based (usually paclitaxel) treatment, which achieves a complete response in approximately 80% of patients. But Multiple uncontrolled studies have examined the effectiveness of single and multiple cycles of high-dose chemotherapy (HDC) of paclitaxel/platinum combination

with stem cell support (peripheral stem cells or autologous bone marrow transplantation) in patients with advanced and chemo-resistant epithelial ovarian cancer.

In review, treatment of ovarian cancer by stem cell culture therapy has explained in which the basic treatment process surgery or chemotherapy was explained but now a day a new technology or advances is become highlighted in this field which is immunotherapy but it is in trial zone. Current immune therapies for ovarian cancer and new developing therapy skill how much successful in future and which type of drugs will come and which type of mutation cause or not. These are the some points which will face by us in future.

Conclusion

Advances in stem cell research will provide enormous opportunities for both biological and future clinical applications. Basically, stem cells could replicate any other cells in the body, offering immense hope of curing Alzheimer's disease, repairing damaged spinal cords, treating kidney, liver and lung diseases, ovarian cancer and making damaged hearts whole. It offers lots of medical benefits in the therapeutic sectors of the regenerative medicine and cloning. In this culture or therapy technique new technique are developed called immunotherapy on the basis of stem cell culture technique except chemotherapy and surgery but it is in trial zone and by some trials got successful result.

The potential for profit is staggering. However, this field of research still faces myriad biological, ethical, legal, political, and financial challenges. The eventual resolution of these conflicts will determine the success of the research and potentially the faces of medicine in the future. It helps the researchers know more about the growth of human cells and their development.

In future, the stem cell research can allow the scientist to test a number of potential medicines and drugs without carrying out any test of animals and humans. The drug can be tested on a population of cells directly and treatment of a number of birth defects, infertility problems and also pregnancy loss and treatment of the abnormal development in the human body.

References

1. Role of stem cells in cancer therapy and cancer stem cells: a review. Jayesh Sagar,[1,2] Boussad Chaib,[2] Kevin Sales,[2] Marc Winslet,[1,2] and Alexander Seifalian[1,2] Published online 2007 Jun 4. doi: 10.1186/1475-2867-7-9
2. Advances in culture and manipulation of human pluripotent stem cells. J Dent Res. 2013 Nov; 92(11):956-62. doi: 10.1177/0022034513501286. Epub 2013 Aug 9. Qian X[1], Villa-Diaz LG, Krebsbach PH.
3. Ovarian cancer stem cells: a new target for cancer therapy. Vol. 2013, article ID 916819. http://dx.doi.org/10.1155/2013/916819. Qinglei Zhan, Chunmei Wang, and Saiming Ngai.
4. Hematopoietic cell transplantation for ovarian cancer. atena. Number: 0635.
5. Stemcell.childrenhospital.com (history of stem cell research- a timeline)
6. A brief review of recent advances in stem cell biology. Neural Regeneration Research. 2014 Apr 1; 9(7): 684–687. doi: 10.4103/1673-5374.131565 . Jinhui Chen, M.D., Ph.D.,[1] Libing Zhou,[2] and Su-yue Pan[3]
7. Stem cell basic, last modified on April 08, 2015. U. S. Department of health and human services. National institute of health.
8. Cancer immunotherapy, CRI. Reviewed by Dr. Kunle Odunsi (M.D., Ph.D), Roswell park cancer institute, Buffalo, NY
9. Advances in Bioscience and Biotechnology, 2012, 3, 219-226 ABBhttp://dx.doi.org/10.4236/abb.2012.33030 Published Online June 2012 (http://www.SciRP.org/journal/abb/)
10. An animal cell culture: Advance technology for modern research. Rajeev Nema1, Sarita Khare2 . 1Department of Zoology and Biotechnology, Sarojini Naidu Government Girls Post Graduate (Autonomous) College, Bhopal, India . 2 Center for Microbiology & Bio-Technology Research and Training, Bhopal, India.
11. Ovarian cancer treatment protocols. Updated – Dec. 22, 2016. Author – Shannon M Grabosch M.D.

12. West Virginia university. Studing the advances in next generation stem cell culture technology. By the McGowan Institute for regenerative medicine. Dr. Yong Yang PhD.
13. Chemotherapy for ovarian cancer, American cancer society.
14. Stem cell research in India. RIS (Research and Information system of developing countries) Asian Biotechnology and Development Review, Vol. 8, No. 3, PP- 43-53, 2006.
15. National cancer institute (NIH). Diagnosed with ovarian cancer, a researcher mined TCGA data to study her own disease. Dec. 6, 2016, by Amy E. Blum (M.A.)

Gene Medicine and Disease Model

Shebe Mosa[1]

Abstract

Gene medicine is a newer term for medical genetics and incorporates areas such as gene therapy. Medical genetics is the branch of medicine that involves the diagnosis and management of hereditary disorders. SCID (severe combined immunodeficiency) is an inherited primary immunodeficiency disease (PIDD) that typically presents in infancy results in profound immune deficiency condition resulting in a weak immune system that is unable to fight off even mild infections. It is considered to be the most serious PIDD. The concept of SCID as a favorable model disease for early gene therapy studies and represent the first demonstration of a significant clinical benefit from gene therapy. Gene therapy for the X-linked form of SCID (XSCID) was attempted in two infants. XSCID is due to genetic defects of an X-linked gene encoding a component of the cell surface receptor for growth factors involved in lymphocyte development and activation This method is done by ex vivo gene therapy method in which stem cells, hemopeutic stem cells, and bone marrow is used as a source for treatment. From the given review and research SCID shows a positive and successful treatment through gene therapy. Continuing technological progress in gene targeting and stem cell manipulation should improve safety and efficacy and thus prompt a significant extension of the application of gene therapy as a treatment for inherited diseases and notably those of the hematopoietic system and the skin.

Introduction

Gene medicine is a newer term for medical genetics and incorporates areas such as gene therapy, personalized medicine and a rapidly emerging new medical speciality, predictive medicine. Medical genetics is the branch of medicine that involves the diagnosis and management of hereditary disorders. Medical genetics differs from human genetics in

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that the human genetics is a field of scientific researches that may or may not apply to medicine, while medical genetics refers to the application of genetics to medical use.(1)

Disease name- SCID (severe combined immunodeficiency) is an inherited primary immunodeficiency disease (PIDD) that typically presents in infancy results in profound immune deficiency condition resulting in a weak immune system that is unable to fight off even mild infections. It is considered to be the most serious PIDD. (2)

Causes – Genetic defects that affects the function of T cells. Depending on the type of SCID, B cells and NK cells can also be affected. Other forms of SCID are caused by a deficiency of the enzyme adenosine deaminase (ADA) and a variety of other genetic defects. X-linked SCID (SCID-X1) is caused by mutations on the X chromosome that typically result in no functional T-cells and natural killer cells; B-cell function is also impaired. Children born with SCID-X1 live in a germ-free environment and have decreased life expectancy. (2) Adenosine deaminase(ADA)-deficient SCID results from genetic defects in an enzyme involved in purine metabolism. The build-up of toxins harms development of T cells, B cells, and natural killer cells, severely reducing their numbers. If immune function is not restored, children with ADA-deficient SCID may die in early infancy. (3)

II) Review

Gene therapy is a form of molecular medicine based on the addition of a corrected copy of a gene to the somatic cells of an individual in order to cure or to alleviate his/her disease. This strategy may provide new treatments for a large number of inherited diseases in the near future.

Four main mechanisms of SCID disease have been described -

(a) Premature cell death caused by the accumulation of purine metabolites,in adenosine deaminase (ADA) deficiency.
(b) Defective cytokine-dependent survival signaling in T cell precursors (and sometimes NK cell precursors).
(c) Defective V(D)J rearrangements of the TCR and B cell receptor genes.

(d) Defective pre-TCR and TCR signaling. (5)

The practical use of gene therapy is currently limited to 2 cell types: accessible stem cells and terminally differentiated, postmitotic, long-lived cells. The characteristics of the target cells greatly influence the choice of viral vector for gene delivery; vectors able to integrate into the host genome are necessary when dividing cells are targeted, in order to ensure the replication of the transgene, while non integrative vectors can be used when gene transfer is performed in postmitotic cells. RNA viruses (retro- and lentiviruses) are used to mediate integrative gene transfer(6,7). Conversely, DNA viruses provide non integrative means of transferring therapeutic genes. Two viruses have been abundantly used in clinical trials of gene therapy(8-10): adenovirus (Ad) and adeno-associated virus (AAV). Given that their genetic material does not integrate into cells and is not replicated at cell division, usage of these 2 viruses is limited to the infection of post mitotic cells.

These 2 stem cell types are well characterized by their capacity to self renew and maintain specific functions over an individual's lifetime. The cell types' accessibility, ability to survive in ex vivo cell culture, and transplantability are advantageous for their use in gene therapy(10-15)

There have been clinical trials of gene therapy since 1990. The first attempt to treat a disease targeted a form of severe combined immune deficiency (SCID) due to defects in the gene encoding adenosine deaminase (ADA). SCID was chosen because of evidence from three decades of experience with allogeneic bone marrow transplantation for SCID which demonstrated that a modest number of genetically normal bone marrow HSC can develop into a protective immune system.(16)

The first trial of gene transfer for ADA-deficient SCID actually used peripheral blood T lymphocytes, rather than bone marrow (HSC). But, it is not possible to determine whether the patients had any clinical benefit as a result of the gene transfer, because they continue to be treated with enzyme replacement therapy, by weekly intramuscularly injections of a modified form of ADA protein. Subsequent clinical trials of

gene transfer for ADA-deficient SCID have produced modest results(17), without incontrovertible evidence of clinical benefit.

The concept of SCID as a favorable model disease for early gene therapy studies and represent the first demonstration of a significant clinical benefit from gene therapy. Gene therapy for the X-linked form of SCID (XSCID) was attempted in two infants. XSCID is due to genetic defects of an X-linked gene encoding a component of the cell surface receptor for growth factors involved in lymphocyte development and activation, the common cytokine receptor gamma chain or γc.(18)

III) Treatment

Material = gene, somatic cells, stem cell

Method = exvivo gene therapy method

Stem cells harvested from patients body and insert a designed therapeutic gene with a therapeutic design vector and then culture it after this stem cells reintroduced into SCID patient's body. After sometime of treatments improvements observed in which WBC count has nearly doubled and boosted immune system and treatment had successful result. "The new vector designs have had the viral promoter sequences deleted, and instead the therapeutic gene is transcribed from an internal promoter, which does not have the ability to activate nearby genes.(4)

In the new study treating SCID-X1 with gene therapy, the 10 patients received the therapy at a median age of 10 months (the youngest patient was treated at 4 months and the oldest at 46 months). HSCs were removed from each patient and "repaired" by transduction (ie, delivery of corrected genes by a viral vector). Each patient was infused with his or her own transduced $CD34^+$ HSCs and progenitor cells. No myelo suppression or immune suppression was used.(3)

The vectors most commonly used to introduce genetic information into HSCs and/or progenitor cells are RNA viruses. They were actually the first viral delivery systems to be developed retroviral vector for gene therapy applications. retroviruses are "simple" viruses.(5)

Both of these SCIDs are treatable by HSCT if a matched HSC donor can be found. Patients with ADA-SCID can also be treated with enzyme-replacement therapy (ERT), but

immunological deficits are not fully corrected, so patients easily acquire infections. Less-than-optimal HSC matches may result in graft-vs-host disease, other morbidity, and mortality.(3)

Bone marrow was collected from the infants and exposed to a retroviral vector carrying a normal copy of the human γc gene. The marrow cells were returned to the infants by intravenous infusion. Over the subsequent months, both infants developed normal numbers of T lymphocytes and natural killer (NK) cells, which showed evidence of immunologic function. Both infants have remained in good health, free of opportunistic infections, growing and developing without protective isolation. Initial evidence suggests they have also developed B lymphocyte function with the presence of protective levels of antibodies, although the number of B lymphocytes remains low(18)

Result

A child had a condition called SCID had been born without an immune system due to a genetic defect known as “bubble boy” disease which was treated with gene therapy and was successful.(4)

Continuing technological progress in gene targeting and stem cell manipulation should improve safety and efficacy and thus prompt a significant extension of the application of gene therapy as a treatment for inherited diseases and notably those of the hematopoietic system and the skin.(5)

The concept of gene therapy is simple: insert a working gene into a person with a faulty version, and its product should overcome the defect. But the reality is more complicated; because you need something to integrate the gene into the patient’s DNA and persuade the cells to read it. In other words, you need a vector. Gene therapy is an emerging medical modality in which genetic diseases will be corrected by transfer of a normal version of the relevant gene into a patient's somatic cells. Gene transfer into the hematopoietic stem cells (HSC) of patients with hemoglobinopathies, congenital immune deficiencies and lysosomal storage diseases followed by their autologous transplantation

could provide the same benefits as allogeneic transplantation, without the immunologic complications of graft rejection, graft versus host disease, and post-transplantation immunosuppressive therapy. While the use of gene therapy to treat blood diseases is logical, this vision remains unfulfilled, primarily due to the inadequacies of the tools used for gene transfer and expression. Despite cycles of rising hope and sinking despair in the field of gene therapy, the techniques for gene transfer, gene expression, and hematopoietic stem cell manipulation have steadily improved.(4)

Initial trials of gene therapy for ADA deficiency SCID many clinical trials of gene therapy have been performed for a broad array of conditions. They have been only hints of potential efficacy in a few. Therefore the study in SCID provide at last proof of principle for gene therapy.(18)

Usage of replication defective retroviruses has provided proof of principle for gene therapy as a powerful therapeutic approach to correcting monogenic diseases affecting the hematopoietic system and justifies all the ongoing efforts to improve these preliminary clinical results. Continuing technological progress in gene targeting and stem cell manipulation should improve safety and efficacy and thus prompt a significant extension of the application of gene therapy as a treatment for inherited diseases and notably those of the hematopoietic system and the skin.(5)

Discussion

Gene therapy is a form of molecular medicine based on the addition of a corrected copy of a gene to the somatic cells of an individual in order to cure or to alleviate his/her disease. This strategy may provide new treatments for a large number of inherited diseases in the near future. Both of these SCIDs are treatable by HSCT if a matched HSC donor can be found. Patients with ADA-SCID can also be treated with enzyme-replacement therapy (ERT), but immunological deficits are not fully corrected, so patients easily acquire infections. Less-than-optimal HSC matches may result in graft-vs-host disease, other morbidity, and mortality.

References

1. https://en.m.wikipedia.org. (availableunder CC BY-SA 3.0)
2. www.aaaai.org>conditions.and.treatments.
3. Medscape medical news gene therapy for severe combined immunodeficiency, jacquelyo k. beats, phd.
4. "'bubble kid' success puts gene therapy back on track" article, 30 october 2013, by Linda geddes.
5. The journal of clinical investigation, gene therapy for severe comined immunodeficiency , marina cavazzana-calvo and alain fischer.
6. Kay M.A., Glorioso J.C., Naldini L. 2001, Viral vectors for gene therapy: the art of turning infectious agents into vehicles of therapeutics. PubMed, Nat. Med. ; 7:33–40.
7. Verma I.M., Weitzman M.D. 2005, Gene therapy: twenty-first century medicine. Annu. Rev. Biochem. PubMed ;74:711–738.
8. Jiang H., et al. 2006, Evidence of multiyear factor IX expression by AAV-mediated gene transfer to skeletal muscle in an individual with severe hemophilia B. Mol. Ther. PubMed ;14:452–455.
9. Lanuti M., et al. 1999, Evaluation of an E1E4-deleted adenovirus expressing the herpes simplex thymidine kinase suicide gene in cancer gene therapy. Hum. Gene Ther. PubMed ;10:463–475.
10. Manno C.S., et al. 2003, AAV-mediated factor IX gene transfer to skeletal muscle in patients with severe hemophilia B. Blood. PubMed ;101:2963–2972.
11. Antoine C., et al. 2003, Long-term survival and transplantation of haemopoietic stem cells for immunodeficiencies: report of the European experience 1968-99. Lancet., PubMed ;361:553–560.
12. Gallico G.G., 3rd, O'Connor N.E., Compton C.C., Kehinde O., Green H., 1984, Permanent coverage of large burn wounds with autologous cultured human epithelium. N. Engl. J. Med., PubMed ;311:448–451.
13. Brouard M., Barrandon Y. 2003, Controlling skin morphogenesis: hope and despair. Curr. Opin. Biotechnol. PubMed ;14:520–525.

14. Ferrari S., Pellegrini G., Matsui T., Mavilio F., De Luca M. 2006, Gene therapy in combination with tissue engineering to treat epidermolysis bullosa. Expert Opin. Biol. Ther. PubMed ;6:367–378.
15. Mavilio F., et al. 2006, Correction of junctional epidermolysis bullosa by transplantation of genetically modified epidermal stem cells. Nat. Med. PubMed ;12:1397–1402.
16. Parkman R 1986 The application of bone marrow transplantation to the treatment of genetic diseases. *Science* **232**:1373–1378.
17. Kohn DB, Hershfield MS, et al. 1998,Lymphocytes with a normal ADA gene accumulate after transplantation of transduced autologous umbilical cord blood CD34+ cells in ADA-deficient SCID neonates. *Nat Med* **4**:775–780.
18. *Research news Pediatric Research* (2000) **48**, 578–578; doi:10.1203/00006450-200011000-00002.

Vocational Interest of Higher Secondary Pupils with Reference to Parental Occupation

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Abstract

The need of education in every stage of life is necessary. The modern man has become professional in every field. So the students are not free from that. They choose occupation from the beginning. Occupation choice is not an easy task for both students and parents also. Parents are pressurizing their children to choose the occupation which they prefer. Some Children agree to continue their parent's occupation and some are not interested to continue as they have different opinion about their occupation.

The present study is confined to 32 boys and 32 girls of Raipur city whose parents have different occupations. A self made questionnaire was applied as a tool through simple random sampling to study their views. It is hypothesized that there exists no significant difference between a doctor's child (Boys and Girls) to become a Doctor and also there is no significant difference of engineer's child (Boys and Girls) to become an Engineer.

Keywords

Vocational Interests, Higher Secondary Pupils and Parental Occupation.

Introduction

The Problem of career choice has implications for national development. In every society, the quality of worker as well as their degree of job satisfaction contributes directly or indirectly to economic stability and smooth running of the affairs of the nation. If the workers are unable to drive satisfactions from their job, frustration sets in with. Career choice is an important step in every bodies life because it moulds one's character, determines one's social status, income, style of life. Choice of occupation has a persuasive connection with one's entire way of life. In

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other words, person's vocational choice plays on professions, occupations, employment by which one corns his living especially one for which he has a period of training is on institution or through apprentice ship.

Vocational choice decision making is not an easy task, yet at one time or the other, individuals are paced with the last of making choice in carrier, preparing for it, starting it and making progress in it, the choice point is undoubtedly the most critical stage, and this is because making a wrong carrier. Decision can finish one's happiness of his life and this could result to vocational maladjustment. Now a days the parents are too much involved with their children for choosing the right occupation for their children. They engage their child in professional coaching institution to suit to the requirement of the profession. There are so many factors affecting vocational decision making.

Factors affecting vocational decision making:

1. Individual Differences,
2. External factor.

Individual Differences

Every individual has different personal characteristics like intellectual ability aptitude, interest, motivation, physical health, etc. so the choice of occupation differs from man to man.

External Factors

Teacher's influence – a teacher is the central point of learning in a classroom situation this is because he/she decides whether the subject will be of interested to the students or not.

Parental Pressure of Influence

Parents generally would wish their children to achieve where they had failed. Some parents put pressure on their children to join their profession.

Economic and Political Conditions

Due to economic depression in the developing countries like U.S.A., Canada etc. some software companies changed their business policy.

Peer Group Pressure or Influence

Educators considered peer group to be an effective and powerful instructional strategy that can be used to develop academic as well as social skills in for choosing their occupation what their friends choose.

Importance of the Problem

There are many studies have conducted about vocational interests of the students. Some developing countries, govt. also appoint the career counselor to guide properly to the children while choosing their career and prepare themselves for a right vocational choice. The school should take up the responsibility of helping the child in the vocational sphere of his life, because occupation is not only a means of earning livelihood but also a way of life, asocial role.

Definition of Functional Word

i)Vocational Interest –

Vocational interest means generalized feeling of liking or disliking to various vocational activities.

ii)Higher Secondary Level –

The 10^{th} , 11^{th} , and 12 standard of the students with which they have to maintain their livelihood of students are called the higher secondary students.

iii)Parental occupation –

Parental occupation is related to the service or any occupation of the parents.

Delimitation and Area of Problems

1. Population of the study consistS of English and Hindi Medium Secondary Schools of Raipur.

Objectives Of The Study

1. To anlyze the vocational interests of higher secondary students.
2. To estimate the role of sex in selection of vocational interest pattern.
3. To assess the role of parental occupation in developing vocalional interests.

Hypothesis of Problems

H1 : There will be no significant difference in vocational interest of Doctor's child (Girls and Boys) to become a doctor.

H2 : There will be no significant difference in vocational interest of teacher's child to become a teacher.

H3 : There will be no significant difference in vocational interest of engineer's child to be an engineer.

H4 : There will be no significant difference in other occupation to continue their parents occupation.

Research Process

1. **Research Method**

   The present study will be carried out through survery method.

2. **Sampling Method**

   Random sampling method will be chosen by the researcher for fulfilment of the collection of sample.

3. **Selection of Tool**

   The researcher used self made tool to know the vocatinal interests of higher secondary puplis with reference to their parental occupation.

Testing and Proving of Hypothesis

Based on the collective data the hypothesis is tested in the following ways:

H_1- There will be no significant difference in vocational interest of Doctor's child (Girls and Boys) to become a doctor.

To know the doctors parents both girls and boys interest score to become a doctor mean, sum of square of mean deviation and the t value table-

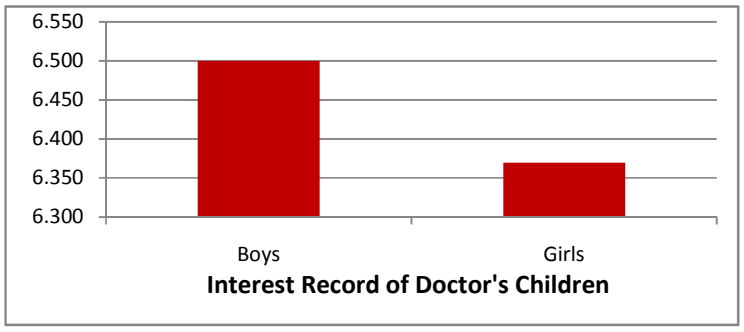
Doctor's child	Numbers	Mean	Sum of square of mean deviation	T value	Significant/ not significant
Girls	8	6.37	7.82	.216	not significant of .05 level
Boys	8	6.5	26		

DF = 14

The content of above table shows that doctor's child; both girls and boys show their interest to be a doctor mean's of girls are 6.37 and boys are 6.5 respectively. Sum of square of mean deviation of girls are 7.82 and boys are 26. There is a difference between boys and girls means. Boys' means are more than the girl's means to see the significant of mean researcher calculate the t value which is .216. DF = 14. On .05 level is table value of t = 2.14 this value is more than calculated t value .216.

That's why there is no difference between interest of boys and girls to become a doctor.

Hypothesis $H_{01:}$ There will be no significant difference in vocational interest of Doctors' girl child and boy child to become a doctor is proved.



H_2 – Hypothesis H_2 are tested in the following way

H_2 – "There will be no significant difference in vocational interest of teacher's child to become a teacher".

To know the doctors parents, both girls and boys interest score to become a teacher mean, sum of square of mean deviation and the t value table-

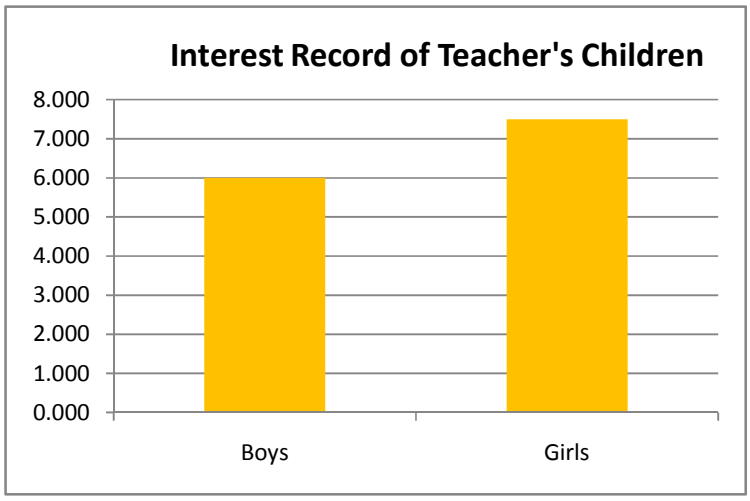
Teacher's child	Numbers	Mean	Sum of square of mean deviation	T value	Significant/ not significant
Girls	8	7.5	2	2.05	not significant of .05 level
Boys	8	6	28		

DF = 14

The content of above table shows that teacher's children; both the girls and boys show their interest to be a teacher mean's of girls are 7.5 and boys are 6 respectively. Sum of square of mean deviation of girls are 2 and boys are 28. There is a difference between girls and boys means. Girls means are more than the boys means to see the significant of mean researcher calculate the t value which is 2.05 DF = 14. On .05 level is table value of t = 2.14 this value is more than calculated t value 2.05

That's why there is no difference between the interests of boys and girls to become a teacher.

H_2 – There will be no significant difference in vocational interests of teacher's child to become a teacher is proved.



H_3 – Hypothesis H_3 are tested in the following way

H_3 – "There will be no significant difference in vocational interest of Engineer's child to become an Engineer".

To know the Engineer parents, both girls and boys interest score to become an Engineer mean, sum of square of mean deviation and the t value table-

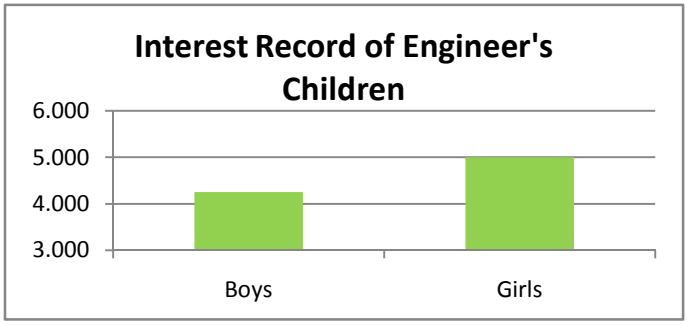
Engineer's child	Numbers	Mean	Sum of square of mean deviation	T value	Significant/ not significant
Girls	8	5	4	1.82	Insignificant of .05 level
Boys	8	4.25	5.48		

DF = 14

The content of above table shows that Engineer's children; both girls and boys show their interest to be an Engineer mean's of girls are 5 and boys are 4.25 respectively. Sum of square of mean deviation of girls are 4 and boys are 5.48. There is a difference between girls and boys means. Girls means are more than the boys means to see the significant of mean researcher calculate the t value which is 1.82 DF = 14. On .05 level is table value of t = 2.14 this value is more than calculated t value 1.82

That's why there is no difference between interest of boys and girls to become an Engineer.

H_3 – "There will be no significant difference in vocational interests of Engineer's child to become an Engineer" is proved.



H_4 – "There will be no significant difference in other occupation to continue their parents' occupation."

To know the other parents, both girls and boys interests score to become a other mean, sum of square of mean deviation and the t value table-

other occupation	Numbers	Mean	Sum of square of mean deviation	T value	Significant/ not significant
Girls	8	7.125	14.80	.98	not significant of .05 level
Boys	8	6.5	8		

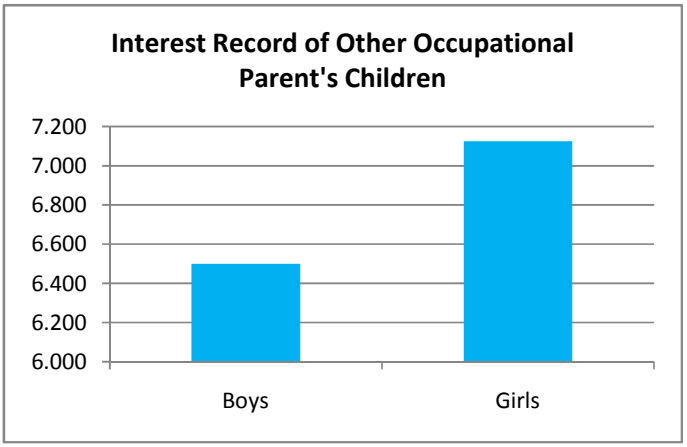
DF = 14

The content of above table shows that other occupation both girls and boys show their interests to continue their parents' occupation. The mean of girls are 7.125 and boys are 6.5 respectively. Sum of square of mean deviation of girls are 14.80 and boys are 8. There is a difference between girls and boys means. Girls means are more than the boys means to see the significant of mean researcher calculate the t value which is .98 DF = 14. On .05 level is table value of t = 2.14 this value is more than calculated t value .98

That's why there is no difference between interest of boys and girls to continue their parents' occupation as their own occupation.

This hypothesis H_4

H_4 – "There will be no significant difference in other occupation to continue their parent's occupation." is proved.



Conclusion

Vocational choice decision making is not an easy task. The choice points are undoubtedly the most critical stage. This is because making a wrong career decision can finish one's happiness in his total life and this could result to vocational maladjustment. Many developed countries in the world have appointed the guidance councilor in the school in order to avoid the vocational maladjustment.

Keeping all these things in mind the choice of occupation is a most important decision of life. So the students, the parents and the teachers are also requested to take care of all the things of students while choosing their occupation.

Bibliography

1. Alika, H.I. and Egbochuku, E.O.(2009).Vocational Interest, Counselling,socio-economic Status and Age as Correlates of Re –entry of girls into School in Edo State. *Edo Journal of Counseling*. Vol.2 (1), 9-16
2. Buch, M.B.(1974).*A Survey of research in education*. Baroda, Centre of Advance Study in Education (C.A.S.E.), M.S. University Baroda.
3. Kothari, C.R. (1999). "*Research Methodology* "Second Edition. Published by new Age International (p) Ltd.
4. Mishra, S. (2013).Opinion of parents, teachers and students towards private tuitions in Sikkim. *ASIAN RESONANCE* 2(4), 324-331.
5. N.R. Saxena, B.K. Mishra, R. k .Mohenty (1998) "*Teacher Education*."Surya Publication, Meerut-250001
6. Saxena,S.(1973).*Sociological Perspectives in Indian Education*. New Delhi: Ashajanak Publication

छत्तीसगढ़ी लोक–साहित्य एवं शिक्षा : एक परिचय

सोहन कुमार मिश्र[1], डॉ. जुबराज खमारी[2]

शोध संक्षेपिका

आदिम मानव हमारे पूर्वज हैं। यह इतिहास हमें बताता है कि वे प्रकृति के साथ अपने अस्तित्व के लिए किस प्रकार संघर्षरत रहे । आखेट युग हो या उपग्रह काल, अमीबा हो या एस्ट्रोनॉट, आदिम मानव हो या रोबोट सभी परिस्थितियों में मानव के संघर्ष की कहानी प्रकृति बयान करती है। चाहे छत्तीसगढ़ हो या अफ्रीका, चाहे अमेरिका हो या कांगों का कछार सर्वत्र प्रकृति पुत्रों की एक ही कहानी है। इतिहास में उनका दिल धड़कता है। इतिहास के अध्ययन की यांत्रिक प्रक्रिया में हम इनके उर्मिल स्वरुप को भूल जाते हैं।

हम छत्तीसगढ़ की लोक साहित्य के अध्ययन पर प्रस्तुत कर रहें हैं । यह साहित्य आदिम युग से 21 वीं सदी तक की संस्कृति व सभ्यता को समेटे हुए है। साहित्य से यह ज्ञात होता है कि विकास के चरणों में किस प्रकार से जीवन के विभिन्न रुप की तरह से श्रृंखलाबद्ध रही है। लोक साहित्य मानव सभ्यता व संस्कृति की कहानी है। इन साहित्यों के माध्यम से हमें जीवन की समग्रता का एक सूक्ष्म कण भी प्राप्त हो जाए तो हमारा प्रयास सफल हो जाएगा।

जनजाति संस्कृति व सभ्यता भी प्रकृति की तरह पूर्ण उन्मुक्त, सहज, समाहारी व समावेशी है। सह सभ्यता वियुक्त नहीं वरन् संयुक्त है। सम्पूर्ण भारत में आदिम जातियों के साथ जितनी भी बाहरी जातियों का समागम हुआ वह संपूरक रहा विनाशक नहीं। केवल एक ही नाम भारतीय संस्कृति व सभ्यता के नाम से जानी जाती है। अतः भारतीय सभ्यता व संस्कृति में जनजाति व नागरिक के मध्य कोई अंतर नहीं है। जनजातीय अध्ययन करते समय हमें भारत की समग्रता को ध्यान में रखना होता है।

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[1]शोधार्थी , मैट्स विश्वविद्यालय, आरंग, रायपुर, छ.ग, भारत
[2]शोध निर्देशक, मैट्स विश्वविद्यालय, आरंग, रायपुर, छ.ग.,, भारत

छत्तीसगढ़ जनजाति क्षेत्र वन्य क्षेत्र हैं । जहां यहां के मूल निवासी जनजाति वर्ग के लोग रहते हैं वहीं इनकी अपनी भाषा व संस्कृति तथा संस्कार हैं । इनकी खास विशेषता यह है कि ये सामूहिक जीवन के प्रति अतिसंवेदनशील होते हैं। जनजाति वर्ग के लोगों में निःस्वार्थ व स्वाभाविक रुप से दूसरों की ज़रुरतों को पूरा करने में मदद करते हैं। यह वर्ग बेइमानी, एहसान जैसे व्यवहार से अलग सरल व प्राकृतिक जीवन जीते हैं। मेहमान का भी स्वागत सारा गांव मिलकर करता है । साथ ही सारा गांव मिलकर आपसी विवादों को सुलझाता भी है।

वर्तमान में शहरी सभ्यता के प्रभाव से जनजातीय भावनाओं का दुरुपयोग होने के कारण जनजाति आज अपने मूल्यवान सभ्यता से अलग होते जा रहे हैं। जनजातीय प्रकृतिधर्मिता आज के यांत्रिक युग में कैसे समायोजित हो पायेगी यह एक कठिन प्रश्न के रुप में चिंता का विषय बन रहा है।

जनसंख्या की दृष्टि से छत्तीसगढ़ का हर तीसरा व्यक्ति जनजाति है। छत्तीसगढ़ में लगभग जनजाति की कुल 42 उपजातियाँ पायी जाति हैं। जिनमें गोंड़, कंवर, हल्बा, भतरा, उरांव, बींझावार बड़े समूहों में पाये जाते हैं। बैगा, अबुझमाड़िया, कमार, बिरहोर, पहाडी कोरवा, विशेष पिछड़ी जनजातियाँ हैं।

छत्तीसगढ़ी लोक साहित्य

आज से 1080 वर्ष पूर्व नवमीं–दसवीं शताब्दी में छत्तीसगढ़ी व अवधी भाषा का विकास अर्धमाग्धी भाषा से हुआ था। छत्तीसगढ़ी भाषा बोलने वालों की संख्या अवधी बोलने वालों की संख्या से अधिक है। अतः यह बोली से उठकर भाषा का रुप लेने की हकदारी है। भाषा, साहित्य पर व साहित्य, भाषा पर आश्रित होता है।

अतः भाषा व साहित्य दोंनों साथ–साथ ही पनपते हैं। प्राचीन काल में ऐसे साक्ष्य मिलते हैं जिससे यह ज्ञात होता है कि छत्तीसगढ़ी लिखित साहित्य के रुप में उपयोग में नहीं लाया जाता रहा। अतीत के लेखकों ने संस्कृत का अधिक उपयोग किया । लगभग 1000 साल पहले छत्तीसगढ़ी भाषा में साहित्य की रचना की गयी।

छत्तीसगढ़ी साहित्य के 1000 वर्षों का वर्गीकरण इस प्रकार किया है–

1. **आदिकाल या गाथाकाल** : सन् 1000 से 1500 ई. तक का काल
2. **भक्ति काल** : सन् 1500 से 1900 ई. तक का काल
3. **आधुनिक काल** : सन् 1900 से वर्तमान तक का काल

छत्तीसगढ़ी लोक साहित्य का विभाजन साहित्यिक प्रवृत्तियों के आधार पर किया गया है। यह विभाजन प्रवृत्ति की सापेक्षिक अधिकता को ध्यान में रखकर किया गया है । इन साहित्यों में भी दूसरे आर्यभाषाओं की तरह ही मध्ययुग तक केवल पद्य विधा की रचनाओं की अधिकता पायी गयी है।

1. आदिकाल या गाथाकाल

आदिकाल सन् 1000 से 1500 ई. तक माना जाता है। यह काल ऐतिहासिक दृष्टि से छत्तीसगढ़ी साहित्य का स्वर्णिम युग माना जाता हैं। गाथाकाल में सामाजिक तथा राजनैतिक स्थिति दोनों ही आदर्श अवस्था में थीं।

छत्तीसगढ़ में बौद्ध धर्म के भी साहित्यिक योगदान मिलते है। इसी कारण यहाँ पाली भाषा का प्रचार हुआ था।

गाथाकाल में मुख्यतः रचनाएँ छत्तीसगढ़ी भाषा में रची गयी हैं। इस काल की गाथाओं में वीर रस तथा श्रृंगार रस की प्रधानता मिलती है। इस काल की गाथाऍं मौखिक रूप से चली आ रही हैं। उस समय साहित्यों कों लिपिबद्ध करने की परम्परा नहीं थी।

गाथा काल की प्रमुख गाथाएँ

इस काल की श्रृंगार रस प्रमुख गाथाएँ कुछ इस प्रकार हैं :–

1. **रानी अहिमन की गाथा**
2. **रानी केवला की गाथा**
3. **रानी रेवा की गाथा**

इन सभी रचनाओं में नारी प्रधान प्रेम के भावों की प्रधानता है। इन रचनाओं में नारी की असहायता, तंत्र–मंत्र, और पारलौकिक शक्तिओं को प्रमुखता से प्रस्तुत किया गया है। इन गाथाओं का आकार अत्यधिक दीर्घ है। लोक–कथाकार जिसे देवार कहा जाता है,

वे जब इस गाथा को सुनाते हैं तो चार–पाँच दिन लग जाते हैं। इन गाथाओं में चारण–काव्य की परम्परा प्रतीत होती है।

रानी अहिमन की कथा के कुछ अंश इस पकार हैं–

सासे के बोलेव सास डोकरिया,
कि सुनव सासे बिनती हमार,
मोला आज्ञा देते सास,
कि जातेव सगरी नहाय,
घर हिन कुंवना कि,
घर हीन बावली,
कि घर हीन करो असनांद,
अहिमन झन जा सगरी नहाय ला,

रानी रेवा की कथा के कुछ अंश इस पकार हैं–

जब मुख बोले पवन रेवा रानी,
सुन राजा मोर बात हो लाल,
बड़ दिन होइगे मोला सगरी देखे बेर,
सगरी नहाय के मोला साध होगे हो ला,
फुलहा तो देखत बिधुन भइगे रानी,
चिरइ अउ चिरगुन पग पंछी देखथे,
पांवे पड़थे छोडो महाराज,

गाथा युग की धर्मिक एवं पौराणिक गाथाएँ

गाथा युग की धार्मिक व पौराणिक गाथाओं में प्रमुख रचनाएँ फुलवासन और पंडवानी हैं।

फुलवासन में सीता व लक्ष्मण की कथा के कुछ अंश इस प्रकार है–

बड़सैड़ता धारी लक्ष्मण जती जोगी,
बारा बरस जोग करेरे भाई,
सात दोहरा को भोजन पका के,
बिना जोते के जमीन के चाउर,

हरी मुंगन के दार पकाई,
बिगन सिकुन के पतरी बना के,
माछी के दूध अउ भरवा के लासा,
बीच तरिया में जाके फुलवासन,
फूल हो फुलथे वाही हा बाबू,

पंडवानी में पांडवों और कौरवों के साथ द्रोपदी के जीवन की कथाओं का वर्णन मिलता है।

भक्ति काल या मध्य काल

भक्ति काल सन् 1500 से 1900 तक रहा। इस मध्य काल में छत्तीसगढ़ में राजनैतिक वातावरण में अत्यधिक अस्थिरता बन गई थी। यह मुख्यतः विदेशी आक्रमणों का दौर रहा। सन् 1536 में सम्भवत: रतनपुर के राजा बहरेन्द्र ने मुसलमानों को अपने राज्य से अलग रखा। इसकाल की रचनाओं में वीर रस की प्रधानता मिलती है।

इस काल में कई धार्मिक और सामाजिक गीत हम प्राप्त करते हैं –

1. मध्ययुग की वीर गाथएँ

2. मध्ययुग की धर्मिक एवं सामाजिक गीत धारा

3. सन्त धरमदास

4. सतनाम पंथ

5. स्फुट रचनाएँ

1. मध्य युग की वीर गाथाएँ

इस काल की प्रमुख गाथाओं में–फूलकुँवर की गाथा, कल्यानसाय की गाथा, गोपाल्ला गीत, रायसिंध के पँवारा, देवी गाथा, ढोलामारु, नगेसर काइना जैसी लघु गाथाएँ हैं। इनके अलावा लोरिक चंदनी, सरवन गीत, बोघरु गीत आदि शामिल है।

फूलकुँवर की गाथा के कुछ अंश इस प्रकार हैं–

तोरे च लड़ाई मैं बेटी करि हौ,
घोड़ा सजाय बर हुकुम दे मोला,

एक ठन बेटी मोर मरि हरि जइबे,
तिरिया तो होके अपने घर में बड़े हे,
छत्तीसगढ़ के बत्तीस राजा ला मारे हे,
फूलकुँवर अब तो पहुचालिस रात ला,
दूसरे तलवार मारन जागे फूलकुँवर
आगे फूंलकुँवर दरबार है ।

कल्यानसाय गाथा के कुछ अंश इस प्रकार है–

रानी कहे भावानमति,
सुन बेटा मोर बात,
मुड़ मुड़ाय पठान बनावे,
अउ पढ़ावे नेवाज,
कान चीर मुंदरी पहिरावे,
कर मूगलाना मेख,
ते पाईके राजा मन,
दिल्ली नई जावेगी,

कल्यानसाय की वीरता का वर्णन डंडा गीत व देवार गीतों मे भी मिलता है।

2. मध्यकाल की धार्मिक एवं सामाजिक गीत धारा

मध्यकाल की धार्मिक एवं सामाजिक गीत धारा का प्रारम्भ कबीर के साथ ही हुआ माना जाता है। कबीर के मानने वाले कबीर–पंथी कहलाते हैं। कबीर–पंथी गीत ही छत्तीसगढ़ी साहित्य की प्रथम लिपिबद्ध साहित्य मानी जाती है।

3. संत धरमदास

संत धरमदास कबीर के शिष्यों मे से एक थे । इनके ही गीत लोगो में आज भी पसंदीदा माने जाते है। इनकी रचनाओं में साक्षात् कबीर के ईश्वरीय प्रेम के दर्शन होते हैं। इनकी रचनाओं के कुछ अंश इस प्रकार हैं–

जमुनिया की डीर मोरी टोर दैव हो,

एक जमुनिया के चौदह डारा,
सार सबद ले क मोड़ देव हो,
काया कंचन गजब पियासा,
नाम बुटी रस घोर देव हो,
सुरत सुवासिन गजब पियासी,
अमरित रस मा बोर देव हो,
सन्तगुरु हमरे ज्ञान जौहरी,
रतन पदारथ जोर देव हो,
धरमदास के अरज गोसांई,
जीवन के बांधे डोर छोर देव हो।

4. सतनाम पंथ

इस पंथ की स्थापना संत घासीदास ने की थी। ये स्वभाव से अत्यंत भावुक थे। इनके जीवन में संत जगजीवन दास जी का अधिक प्रभाव मिलता हैं। घासीदास कबीरपंथी थे, लेकिन गुरु परम्परा के कारण दोनों अलग हो गये। इनकी रचनाओं में ईश्वर कृपा पाने की बात कही गयी है। इनकी रचनाओं के कुछ अंश इस प्रकार है–

चलौ चलौ,
चलौ चलौ हंसा अगर लोक जइबौ,
इहॉ हमर संगी कोनो नइये,
एक संगी हवय घर के तितिया,
देखे मा जियरा जुड़ाथै,
ओहू तिर्या होव बनत भर के,
मरे मा दुसरा बनाथै,
एक संगी हावय कोख बटेवा,
देखे मा घोसा बंधाथै,
ओहू बेटा हावय बनत भर के,

बहू आये ले बुउराथै,

5. स्फुट रचनाएँ

छत्तीसगढ़ी साहित्य के मध्ययुग के आधुनिक स्वर के रुप में स्फुट रचनाओं का अत्यंत ही उल्लेखनीय स्थान है। इन रचनाओं के कुछ कवियों के नाम इस प्रकार हैं –

(अ) गोपाल कवि व उनके पुत्र माखन कवि

ये दोनों कवि रतनपुर के राजा कलचूरी वंश के शासक राजसिंह के समकालीन माने जाते हैं। इनकी रचनाओं में जैमिनी अश्वमेघ, सुदामा चरित, भक्त चिन्तामणि, छन्द विलास, आदि। इन्होंने छत्तीसगढ़ी में पद्य रचनाएँ नहीं की हैं फिर भी इन पर छत्तीसगढ़ी भाषा का प्रभाव मिलता है।

(ब) लक्ष्मण कवि

इन्होंने भोंसला वंश प्रशस्ति काव्य में अंग्रेजों के अतयाचार के बारे में वर्णन किया है।

(स) प्रह्लाद दुबे जी

इनकी रचना जय चन्द्रिका में छत्तीसगढ़ के प्राकृतिक सौंदर्य का वर्णन मिलता है।

आधुनिक काल

छत्तीसगढी साहित्य का आधुनिक काल 1990 ई. से प्रारम्भ माना जाता है। इस युग में सभी विधाओं का विकास हुआ है। यह काल मुख्यतः गद्य के विकास के लिए महत्व रखता है। लेकिन काव्य का भी विकास पर्याप्त मिलता है। इस काल के साहित्यकार इस प्रकार हैं –

(क) पं. सुंदरलाल शर्मा

उच्च कोटि के स्वाधीनता संग्रामी के साथ ही वे उच्च कोटि के कवि भी हैं। इन्हें छत्तीसगढ़ी भाषा के महाकवि का स्थान दिया गया है। इनकी रचनाएँ शुद्ध छत्तीसगढ़ी भाषा में मिलती हैं। इन्होंने कुल 21 ग्रन्थों की रचना की हैं जिसमें छत्तीसगढ़ी दानलीला अधिक प्रसिद्ध है। इनकी रचनाओं के कुछ अंश इस प्रकार हैं –

जानेन चेलिक भइन कन्हाई,

तेकरे ये चोचला ए दाई,

नंगरा नंगरा फिरत रिहिन हे,
आजेच चेलिक कहॉ भइन हे,
कोन गुरु मेर कान फॅकाइना,
बड़ डपोर संख बन आईन,
दाई ददा ला जे नई मान,
ते फेर दूसर ला का जानै।

इन्होनें काव्यामृतवर्षिणी, राजीव प्रेम पीयूष, सीता परिणय, पार्वती परिणय, प्रह्लाद चरित्र, कंस वध, सच्चा सरदार, प्रताप पदावली जैसे मौलिक रचनाऍ की।

(ख) पं. बंशीधर शर्मा जी

इन्होंने छत्तीसगढी. भाषा में पहला उपन्यास लिखा, जिसका नाम है–हीरु की कहानी । छत्तीसगढ़ी भाषा के पहले उपन्यासकार की उपाधि से विभूषित पं. बंशीधर शर्मा जी हिन्दी साहित्य के पं. चन्द्रधर शर्मा गुलेरी के समान साहित्य के क्षेत्र में अमर हो गये हैं।

(ग) कवि गिरीवर दास वैष्णव जी

रायपुर निवासी कवि गिरीवर जी सामाजिक क्रांतिकारी कवि थे। जिनकी अंग्रेजों के खिलाफ लिखी कुछ पंक्तियॉ इस प्रकार हैः–

अंगरेजमन मन हमला ठगके,
हमर देस मा राज करय,
हम कइसे नालायक बेटा,
उंखरे आ मान करय,

इनकी छत्तीसगढ़ी कविता संग्रह –छत्तीसगढ़ी सुनाज के नाम से प्रकाशित हुई है। जिसमें समाजिक बुराईयॉं, अंधविश्वास, जातिगत भेदभाव, छुआछूत, आदि का विरोध मिलता है।

(घ) पं. द्वारिका प्रासद तिवारी जी

पण्डितजी का संबंध मूलतः बिलासपुर से था। इनहोंने साहित्य रचना की प्रारंभ ब्रज और खड़ी बोली से की जो छत्तीसगढ़ी पर आकर समाप्त होती है। इनकी रचनाओं में कुछू

कांही, फागुन गीत, गाँधी गीत, सुराज गीत, क्रांति प्रवेश, आदि। इनकी रचनाओं में प्रेम, श्रृंगार, देशप्रेम, आदि भाव मिलते हैं, जिसके उदाहरण इस प्रकार हैं–

धमनी हाट,
तोला देखे रहेंव गा, तोला देखे रहेंव रे,
धमनी के हाट मां, बोइर तरी रे,
लकर, धकर आयी होही,
ऑखी ला मटकाये,
कइसे जादू करे मोला,
चुन्दी मां तैं चोंगी खोंचे,
झुलुप ला बगराये,

(ड.) स्व. प्यारेलाल गुप्त जी

आधुनिक साहित्य के भीष्म पितामह स्व. प्यारेलाल जी रतनपुर निवासी थे। उनकी पहचान में उनकी रचना प्राचीन छत्तीसगढ़ का अमूल्य योगदान है।इनकी रचनाओं में एक दिन, रतीराम का भाग्य, पुष्पहार, आदि। इनकी कविता के कुछ अंश इस प्रकार हैं–

हमर कतका सुन्दर गांव,
हमर कतका सुन्दर गांव,
जइसे लक्ष्मी जी के पांव,
धर उज्जर लीपे पोते,
जेला देख हवेली रोथे,
सुध्धर चिकनाए भुइया,
चाहे भगत परुस ल गूइया।

(च) कोदूराम दलित

गांधीवादी विचारधारा के हास्य व व्यंग्य कवि पेशे से प्राइमरी स्कूल के मास्टर थे परन्तु कला से वे सबके लोकप्रिय थे। इनकी रचनाओं में सियानी गोठ, कनवा समधी, दू मितान, बाल निबंध, कथा कहानी, छत्तीसगढ़ी शब्द भंडार और लोकोक्ति आदि, इनकी रचना के कुछ अंश इस प्रकार हैं–

धाम–दिन गइस, आइस बरखा के दिन,
सनन–सनन चले पवन लहरिया,
छाये रथ अकास मां चारों खूंट धुंवा साही,
बरखा के अंदर निच्चट भिम्म करिया,
चमकय बिजली गरजे घन घेरी घेरी,
बरसे मूसर धार पानी छर छरिया,
भर में खाई–खोधरा कुंवा डोली–डांगर औ,
टिप टिप ले भरगे नदी नरवा तरिया,

निष्कर्ष

छत्तीसगढ़ी साहित्य में न जाने कितने ही महान साहित्यकार हुए, उनको सूचीबद्ध करना अत्यंत कठिन कार्य है। हमें इन साहित्यकारों को पहचानने की आवश्यकता है। इनकी रचनाओं को सहेजने की आवश्यकता है। इन साहित्यों को विद्यालयों के पाठ्यकमों में शामिल करने की आवश्यकता है। इन साहित्यों का नयी पीढ़ी के लोगों के द्वारा गीत व कविता के माध्यम से अपनाना चाहिए।

संदर्भ ग्रंथ

1. अग्रवाल अनुसूइया (2001), *छत्तीसगढ़ी लोकोक्तियाँ और जनजीवन*, दिल्ली : भावना प्रकाशन ।
2. बेहार रामकुमार (2013), *छत्तीसगढ़ संस्कृतियाँ और विभूतियाँ*, रायपुरः छ.ग. शोध संस्थान।
3. शर्मा पूजा (2009), *छत्तीसगढ़ की लोक संस्कृति*, जयपुर : शिव बुक हाऊस ।

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