3.3.2.1 Research Paper Published in UGC Care Listed Journals

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Investigative Report on Disease Sickle Cell Anemia from Karanja Tehsil of Washim District (M.S.), India

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Abstract

Sickle cell Disease (SCD) is a group of genetic disease commonly seen in United States and Third world countries. The term disease is applied to this condition because the inherited abnormality causes a pathological condition in which red blood cells becomes sickle shaped. In Maharashtra, the sickle gene is widespread in all the eastern districts, also known as the Vidarbha region, in the Satpura ranges in the north and in some parts of Marathwada. The prevalence of sickle cell carriers in different tribes varies from 0 to 35 percent. The tribal groups with a high prevalence of HbS (20-35 %) include the Bhils, Madias, Pawaras, Pardhans and Otkars. It has also been estimated that Gadchiroli, Chandrapur, Nagpur, Bhandara, Yoetmal and Nandurbar districts would have more than 5000cases of sickle cell anaemia. In present study from Karanja tehsil of washim district there are 269 carrier persons and 65 sufferer patients observed in the year 2015

Keywords: Sickle cell, Pathological, Washim, Vidarbha, Anemia.

Introduction

Sickle cell Disease (SCD) is a group of genetic disease commonly seen in United States and Third world countries. The term *disease* is applied to this condition because the inherited abnormality causes a pathological condition in which red blood cells becomes sickle shaped.

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Then there oxygen carrying capacity reduces that can lead to death and severe complications. Sickle cell has a profound impact, not just on the patient, but on the whole family dynamic.

According to a survey there are as many as 150,000 babies born with the disease each year in Nigeria, alone. Closer to home, there are an estimated 72,000 to 100,000 people living with the disease in the United States, with over 1,000 of them living in the state of Indiana. Nearly 5% people from all over world are suffered from a disease sickle cell anemia due to inheritance of a mutant gene. This gene can be transmitting from both parents.

In Maharashtra, the sickle gene is widespread in all the eastern districts, also known as the Vidarbha region, in the Satpura ranges in the north and in some parts of Marathwada. The prevalence of sickle cell carriers in different tribes varies from 0 to 35 percent. The tribal groups with a high prevalence of HbS (20-35 %) include the *Bhils*, *Madias*, *Pawaras*, *Pardhans* and *Otkars*. It has also been estimated that Gadchiroli, Chandrapur, Nagpur, Bhandara, Yoetmal and Nandurbar districts would have more than 5000 cases of sickle cell anaemia (Colah *et al,* 2014).

Three principal current therapeutics modalities available for childhood SCD are blood transfusion, Hydroxy urea and bone marrow transplantation. Genetic counseling, continued medical education for health professionals about sickle cell disease, its complications and management is necessary. World health organization has actively promoted several national screening programs with dual goals of informing reproductive choice and thereby reducing the number of severely affected children (Kaur 2013).

Sickle Cell Disease (SCD), an inherited disorder of the red blood cells, is a major public health problem. India, with a population of 1.2 billion individuals, is estimated to be home to over 50% of the world's patients with SCD. While SCD is common among all ethnic groups in India, high prevalence has been reported in three socio-economically disadvantaged ethnic categories: the Scheduled Castes (SC), the Scheduled Tribes (ST), and Other Backward Class (OBC) groups (Aishwarya Arjunan 2013).

In present study from Karanja tehsil of washim district there are 269 carrier persons and 65 sufferer patients observed in the year 2015.

Materials and methods

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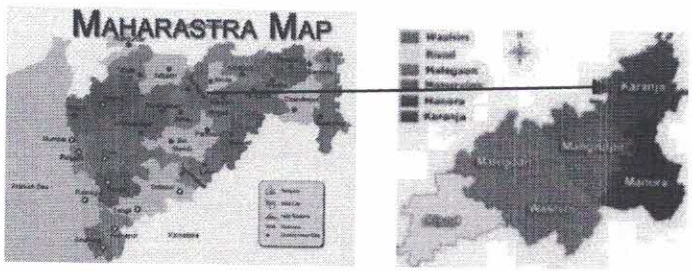
The present study was performed in a year 2015 includes the screening of target populations in all age groups (newborns, school age children, young adults, and pregnant mothers) as well as screening in government hospital as well as camps arranged in villages, colonies in school and colleges for individuals considered to be at high risk of carrying the βs gene. Informed consent was obtained from all adults and parents of children once the individuals were educated on the reasoning behind screening. The screening teams were comprised of a clinician, multiple lab technicians and counselors, and volunteers from the villages surrounding the screening camp.

Study area



Result and Discussion

Sr. No.	Month & Year	Carrier	Sufferer
1	January 2015	32	10
2	February 2015	49	16
3	March 2015	69	16
4	April 2015	00	00
5	May 2015	00	00
6	June 2015	03	00
7	July 2015	00	00
8	August 2015	14	04
9	September 2015	21	04
10	October 2015	23	05
11	November 2015	24	05
12	December 2015	35	05
Total		**269**	**65**

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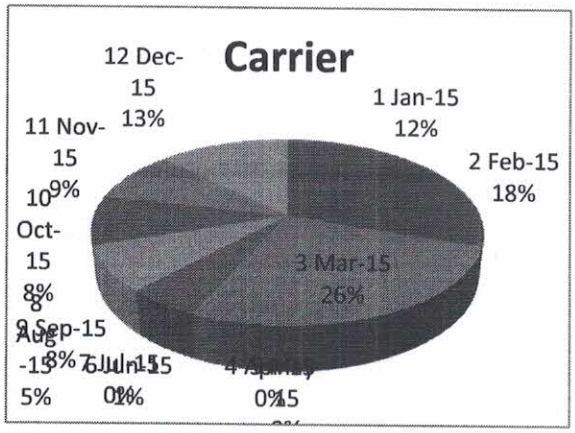

Fig. Carrier persons in 2015

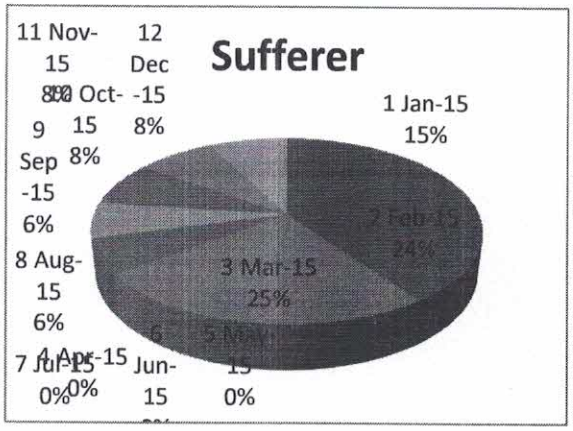

Fig. Sufferer patients in 2015

Bolwar (2015) studied total number of patients of sickle cell from Washim district consisting tehsil Washim, Risod, Karanja, Manora, Malegaon and Mangrulpir was counting during 2011-2014. This study reveals the total number of carrier (AS) was found to be 759 peoples while sufferer (SS) was found to be only 43 peoples. In order to find out prevalence for sickle cell disorder we screened major communities from the state and found high prevalence amongst SC, ST and OBC. The overall prevalence amongst SC, ST and OBC is 10%. Severe joint pains and milder type of jaundice are peculiar symptoms amongst sicklers from the state of Maharashtra (S. L. Kate and D. P. Lingojwar 2002).

Conclusion

While studying about genetic disease like sickle cell it is observed that a recessive trait of sickle cell gene is widely spread in India as well as in endemic region rest of Maharashtra and in the region of Vidarbha. In present study from Karanja Tehsil of Washim district there are 269 carrier persons and 65 sufferer patients found in 2015. It is essential to counsel and literate the people about genetic disease like sickle cell.

Acknowledgement

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members of Government Hospital and team of sickle cell diagnosis for providing authentic data for analysis of disease.

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DIVERSITY OF ZOOPLANKTON AND PHYTOPLANKTON AT YELGAON DAM, BULDANA (M.S.)

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Key words : Zooplankton, Phytoplankton, Yelgaon dam,

Zooplankton diversity reflects quality of water hence constitute an important ecological parameter to assess it. Zooplanktons help in ameliorating polluted water. Present investigation was carried out to study zooplankton, as well as phytoplankton diversity at Yelgaon Dam, situated at about 5 Km from Buldana (M.S.) city towards east side.

Water samples were collected from the dam during January to December 2018, in the first week of every month between7.00 to 10.00 A.M. Plankton net of bolting silk (No. 25) was used for sampling. All samples were collected from mid-stream, 0.5 to 1 m below the surface of water. Plankton samples were collected, fixed and preserved in 5% formalin. Those were identified following Adoni (1985) The phytoplankton species were also separated and identified as described by Patterson DJ (1998).

The Zooplankton species collected during present investigation included 22 species of 16 genera from different groups like Rotifers (12 species of 6 genera), Cladocera (5 species of 5 genera), Copepoda (2 species of 2 genera) and Ostracoda (3 species of 3 genera). Rotifers were with higher population. Copepods,however, showed less population.. Kumar *et. al.* (2015) and Sontakke and Mokashe (2014) reported similarly from Kalpi and Aurangabad respectively.

The phytoplankton population included species belonging to 25 genera from Chlorophyceae (12 species of 11 genera), Euglenophyceae (3 species of 2 genera), Bacillariophyceae (5 species of 5 genera) and Cyanophyceae (15 species of 7 genera), Chlorophyceae being with higher population. Similar results were reported by Kumar *et al* (2015), Kadam *et al* (2014) and Bamane *et al*(2013) from Kalpi, Parbhani and Thane respectively.

Table 1 : Zooplankton population from Yelgaon Dam, Buldana (M.S.) during the year 2018 (Number of organisms per litre).

Sr. No	Month	Rotifera	Cladocera	Copepoda	Ostracoda
1	Jan.	27	31	10	08
2	Feb.	33	42	17	11
3	Mar.	45	65	29	17
4	Apr.	59	85	45	21
5	May	98	81	66	27
6	Jun.	111	69	33	32
7	Jul.	27	10	25	05
8	Aug.	09	06	07	04
9	Sep.	28	09	08	07
10	Oct.	56	18	13	13
11	Nov.	36	32	29	18
12	Dec.	31	26	43	10

Table 2: Phytoplankton population from Yelgaon Dam, Buldana (M.S.) during the year 2018 (Number of organisms per litre).

Sr. No.	Month	Chlorophyceae	Euglenophyceae	Bacillariophyceae	Cyanophyceae
1	Jan.	67	08	51	38
2	Feb.	85	14	53	60
3	Mar.	129	18	66	81
4	Apr.	145	27	70	93
5	May	177	33	83	113
6	Jun.	203	41	28	109
7	Jul.	41	08	14	31
8	Aug.	11	06	08	12
9	Sep.	32	09	12	22
10	Oct.	85	19	45	67
11	Nov.	101	29	65	69
12	Dec.	78	16	57	46

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3.3.2.1 Research Paper Published in Peer Reviewed and Referred Journals

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A Double-Blind Peer Reviewed & Refereed Journal

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Original Article

INTERNATIONAL JOURNAL OF RESEARCHES IN BIOSCIENCES, AGRICULTURE AND TECHNOLOGY

INVESTIGATIVE REPORT ON SICKLE CELL ANEMIA FROM SAKRI TEHSIL

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ABSTRACT:

Sickle cell Disease (SCD) is a group of genetic disease commonly seen in United States and three countries of the world. The term *disease* is applied to this condition because the inherited abnormality causes a pathological condition in which red blood cells becomes sickle shaped. In Maharashtra, the sickle gene is widespread in all the eastern districts, also known as the Sakri region, in the Satpura ranges in the west and in some parts of Khandesh. The prevalence of sickle cell carriers in different tribes varies from 0 to 35 percent. The tribal groups with a high prevalence of HbS (20-35 %) include the *Bhils*, *Madias*, *Pawaras*, *Pardhans* and *Otkars*. In present study from Sakri tehsil of Dhule district there are 39.6% in male and 60.3% in female sickle cell anemic patients found and its ratio was 94.8% in ST category and 14.6% in other categories found

INTRODUCTION:

Sickle cell disorder is a group of diseases caused by a point mutation at sixth position in beta globin chain, valise substituting glutamic acid due to which in deoxygenated state, shape of erythrocytes change to sickle shape and also the fragility of cell member acne increase . In India, it is more common in central and southern parts of the country it is the second most common hemoglobin apathy. Next to thalassemia in India in 1952, Lehman and catbush reported the presence of the disease in India among the tribal of Nigeria hills for the 1st time. This was largely because most of the subsequent reports spread a misconception that the sickle gene in India was confined to the tribal population are some scheduled caste only.

The sickle gene is widespread among many tribal population groups in India with prevalence of heterozygotes varying from 1-40 per cent. Co-inheritance of the sickle gene with β-thalassaemia, HbD Punjab and glucose-6-phosphate dehydrogenase (G6PD) deficiency has also been reported. Most of the screening programmes in India now use high performance liquid chromatography (HPLC) analysis although the solubility test is also sensitive and cheap. Sickle cell disease (SCD) among tribal populations is generally milder than among non-tribal groups with fewer episodes of painful crises, infections, acute chest syndrome and need for hospitalization. (Roshan B. et al., 2015)

Sickle cell disease (SCD) is a very devastating condition caused by an autosomal recessive inherited haemoglobinopathy. This disease affects millions of peoples globally which results in serious complications due to vasoocclusive phenomenon and haemolysis. This genetic abnormality is due to substitution of amino acid valine for the glutamic acid at the sixth position of beta chain of haemoglobin. This disease was described about one hundred year ago. The haemoglobin S (hbS) produced as result of this defect is

poorly soluble and polymerized when deoxygenated. Symptoms of sickle cell disease are due to chronic anaemia, pain full crises, acute chest syndrome, stroke and susceptibility to bacterial infection. In recent years measures like prenatal screening, better medical care, parent education, immunization and penicillin prophylaxis have successfully reduced morbidity and mortality and have increased tremendously life expectancy of affected individuals. (KAUR M et al. 2013).

Sickle cell disease is a major genetic disorder amongst Scheduled Caste (SC), Scheduled Tribe (ST), and Other Backward Communities (OBC) population groups of Maharashtra. We modified diagnosis technique and developed simple laboratory technology to identify carrier (Hb SS) and sufferer (Hb AS) suitable for field work. In order to find out prevalence for sickle cell disorder we screened major communities from the state and found high prevalence amongst SC, ST and OBC. The overall prevalence amongst SC, ST and OBC is 10%. Severe joint pains and milder type of jaundice are peculiar symptoms amongst sicklers from the state of Maharashtra. (S. L. Kate and D. P. Lingojwar 2002).

Chances are that you might not have heard much about Sickle Cell Disease ("SCD") lately. That doesn't mean that it has gone away. It certainly hasn't. SCD is still negatively impacting the lives of millions of people worldwide. There are as many as 150,000 babies born with the disease each year in Nigeria, alone. Gary A. Gibson 2011

MATERIAL AND METHODS:

Study area- Study was conducted in rural area of Sakri tehsil from Jan. 2018 to Dec. 2018. The villages from Sakri tehsil were selected by proportional randomization.

The population was screened by holding camps in each village at evening time as village people are available in the evening time only after 6.00 pm. The population was screened by dithionite tube test CDTT or solidity test.

Dithionite tube turbidity test -

1. Few drops of blood were collected by pricking ring finger and added to glass tube containing sodium citrate in normal saline solution.
2. After mixing, it was centrifuged for 2 to 3 min. at 3000 rpm.
3. 1ml of phosphate buffer reagent was taken in a glass tube.
4. A small quantity of sodium dithionite was added to it and was mixed well to dissolve.
5. A small drop washed red cell of blood is added and was mixed well to produce light pinkish colour.

RESULT, DISCUSSION AND CONCLUSION:

In present study, solubility (DTT) test was used as a screening test as it is a rapid method and easy to be carried out in the field setting, used by ICMR network on sickle cell disorder coordinated by Institute of Immunohematology. The prevalence of disorder was more in age group of 10-20 yrs.

As per data of Govt. rural hospital, Sakri electrophoresis test report shows,

Total test – 116 patients 1 Normal patient – 15 - 12.9% 2 Sickle cell trait – 94 - 81% 3 Sickle cell disease – 7 - 6%

Sex wise percentage 1 Female patient – 39.6% 2 Male patient – 60.3%

Caste wise patient 1 ST category – 84.8% 2. OBC category - 14.6%

Age wise percentage the percentage of disease was more in 10-20 yrs. And minimum in age group 31-50

The sex wise prevalence was 39.6% in male and 60.3 % in female. The maximum prevalence was found in ST category people i.e. 94.8% and in OBC category people was 14.6% respectively. The electrophoresis pattern revealed that 81.0% were sickle cell traits and 6.0% were sickle cell anemic as well as 12.9% is normal.

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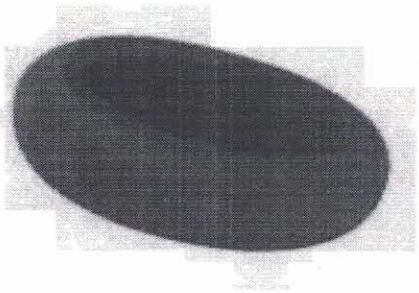
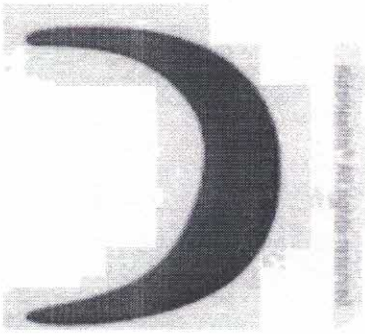
S. L. Kate and D. P. Lingojwar., Epidemiology of Sickle Cell Disorder in the State of Maharashtra., *Int J Hum Genet, 2(3), 2002, 161-167*

Sr. No.	Age	Gender			
		Male	%	Female	%
1	10-20	33	28.4	33	28.4
2	21-30	8	6.8	31	26.7
3	31-40	4	3.4	2	1.7
4	41-50	3	2.5	2	1.7



Normal Red Blood Cell



Sickle Cell