Chapter -VI
Summary and Conclusion
Chapter VI: Summary and Conclusion

SUMMARY AND CONCLUSION

Sickle cell trait is different from sickle cell anemia. People with sickle cell trait don’t have the condition but they have one of the genes that cause the condition like, people with sickle cell anemia, people with sickle cell trait can pass the gene on to next generation. Individual with sickle cell trait inherit one gene for hemoglobin A from one parent and for hemoglobin S from other, leading to AS phenotype. In hemoglobin with SCT (Hb AS) valine is substituted for glutamic acid in the sixth amino acid of the chain β of globin, where as in case of sickle cell disease mutation is seen in both parental genes and the person is homozygous for S (HbSS).

The sickle cell gene occurs throughout Indian society although it is most common among the tribal people, Chhattisgarh is a new state, formed in November 2000 from the south-eastern part of Madhya Pradesh, with approximately 21 million population consisting of 32% tribals. Many studies have been carried out in various populations especially in Chhattisgarh and it has been found that the presence of sickle cell trait is very common in several castes. Although there has been extensive clinical and basic science research in sports persons with SCT, many public health issues, such as blood safety surveillance, compliance with immunizations, follow-up of newborns with positive screening tests, stroke prevention, pregnancy complications, pain prevention, quality of life, and thrombosis, but role of exercise/physical activity or sports performance in this population remain unaddressed. Studies in respect is rare in India & hence the scholar has found passivity and choose this area for the study.
Objectives

1. To assess body composition of the sports person with Heamoglobinopathy.
2. To assess Pulmonary function in sports person with Heamoglobinopathy.
3. To assess cardiovascular fitness of sports person with Heamoglobinopathy.

Significance of the study

1. The outcomes of the proposed work will help creating a database of profile of sickle cell carrier sports persons with SCT.
2. On the basis of the results attempts would be made to delineate exercise program for improvement of health status of fitness/performance in sports persons with SCT and sedentary individuals.
3. The result of the study will facilitate to understand how regular physical activity influences the health and life style of SCT sports persons.
4. The result of the study will help to create awareness regarding SCT in sports persons as well in sedentary individual.

Hypothesis of the proposed work

1. There will be no difference in body composition components between sports person with SCT and control.
2. There will be no difference in pulmonary components between sports person with SCT and control.
3. There will be no difference in Cardio-vascular efficiency of sports person with Sickle cell trait and control.
4. There will be no difference in hemoglobin in sports person with SCT and control.
Materials and Method

At the beginning total one thousands (1000) healthy players (Aged 12 – 18 Years) form the different schools of Chhattisgarh were randomly selected for hemoglobin screening in the present study. All the students were regular student coming school daily but alien to Sickle cell disease. They were moderately trained athlete and practiced athletic activity regularly and participated in school tournaments. Of those only 109 were screened sickle trait carriers subjects and they were selected for the further study.

For this study, their Physical performance (12 minutes run and walk test, VO$_2$ max, One mile run test), pulmonary and cardiovascular Variable (Respiratory Rate, Heart Rate, and Peak Exploratory Rate), and Anthropometric Variable (Height, Weight, Skin Folds, Girth Measurements, Breadth Measurements) taken with apropriet methodology.

Statistical Analysis

Data was retrieved and analyzed by using specific software Excel 2007, for all type of statistical analysis. The analysis was done by using the inbuilt formulas and functions of MS-excel. Descriptive statistics, t-test, etc., were calculated.

Results:

Characteristics of Pulmonary Varibles

Results of the Pulmonary Variables Heart Rate (HR), Respiratory Rate (RR), Peak Expiratory Flow Rate (PFER), and Hemoglobin of sports persons with sickle cell trait carrier subjects and apparently healthy human subjects (1.Pooled, 2.Female, 3. Male, 4. Female aged 11 -14 years, 5. Female aged 15 – 18 years, 6. Male 11 – 14 years, and Male 15 – 18 years) shows distinct variation between the groups.
Chapter VI: Summary and Conclusion

**Heart Rate:** There was no significant difference in average HR of the sports persons with SCT and apparently healthy human subjects.

**Respiratory Rate:** Results of RR showed a statistically significant ($p < 0.05$) difference in the means of the RR of pooled data and male 11-14 years groups, a statistically significant lower RR was witnessed in control subjects. Rest of the groups showed statistically insignificant difference in RR between of SCT and control groups.

**Peak Expiratory Flow Rate:** Result of PEFR clearly indicate a statistically significant ($p < 0.05$) difference in mean of PEFR in most of the group. The PEFR was significantly lower in sports persons with SCT as compare to that of control groups.

**Hemoglobin (Hb):** Results showed a statistically significant ($p < 0.05$) difference in the means of the Hb in pooled, female 14–18 year and male 11-14 years groups, a statistically significant higher Hb was witnessed in physically active SCT subjects. Rest of the groups showed statistically insignificant difference between SCT and control groups but trend showed higher Hb in SCT subjects.

**12 Minute run and walk:** Result of the study showed statistically significant difference ($p < 0.05$ from $t$-test) for distance run between most of the group. The mean distance run was significantly higher in sports person with SCT than the control group.

**Weight, Height and Girth**

Various anthropometric variables measured and body composition variables calculated showed insignificant difference between Sports Persons (SCT) and Control subjects.
Conclusions

On the basis of the above results the following conclusions can be drawn:

1. In the physical performances variables the SCT sports persons perform significantly better than the control.
2. Significant difference was observed in Peak flow Expiratory rate between Sports person with SCT and Control groups, control groups showed higher mean values.
3. There was no significantly differences witnessed in Heart Rate, Respiratory Rate. Hemoglobin percentage between all Sports Person with SCT and Control groups, sports persons with SCT in pooled, female 14-18 years and junior male showed significant higher percentages of Hb.
4. Insignificant difference was observed Anthropometric variables and body composition variable between sports persons with SCT and Control groups.

Recommendations

1. It is recommended that individual with SCT should regularly participate in physical activity which leads to physical, mental, social and other benefits.
2. Hemoglobinopathy Testing of Sports person should be conducted.
3. Awareness programs should be organized which will be helpful in providing information, assistance, and support to individual with SCT.
4. Same study can be conducted on Elite athletes.
5. Same study can be conducted on sedentary population with SCT.
6. Further study can be conducted to see effect of aerobic training on cardio-respiratory system in individuals with SCT.