CHAPTER VII

SUMMARY AND CONCLUSION
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Haemoglobinopathies are most common among world’s population. World health organization declared haemoglobinopathies now one of the most horrible health problem in the world. Haemoglobinopathies includes Sickle Cell disorder, Thalassaemia and Red cell enzyme deficiency (G-6PD).

When we come more near to haemoglobinopathies, it is seen that in most part of the world tribal and caste populations have sickle cell disorder with varying frequency but thalassaemia is seen in most of the Mediterranean population. However, G-6PD deficiency is also found among most of the populations but as far as the tribal and caste populations are concerned. It is seen widely that number of tribal population and caste populations have sickle cell gene with varying frequency.

In Central India, Neo-Buddhist is the only Schedule Caste who has this gene up to 30 percent besides tribal population. Many studies have been carried out by eminent scientist on sickle cell disorder among Neo-Buddhist population and frequency reaches as high as up to 30 percent.

Sickle Cell disorder is a molecular abnormality of Beta-globin chain and it is recessively inherited haemolytic disorder, and it is present in the tropical belt. This gene is located on Autosomal chromosome number 11, and homozygous genotype results in severe anemia leading to fatal physiological condition with a wide variability in disease course. It was first recognized in African population and was considered as Negroid character. However, it is now well established that this particular gene is widely distributed in other parts of the world.

In India Lehman and Cut bush (1952) were the pioneer workers who was first reported presence of HbS in Southern India, Dunlop and Maunder (1952) reported the sickle cell trait in Assam. After that many populations have been tested but it is widely seen that in India most of the tribal population, lower caste population have this gene with varying frequency. Many reported studies on sickle cell indicate selective advantage of sickle cell heterozygote in a malarial environment. Ahmad and Choudhary (1972) have mentioned that distribution of sickle cell disorder can be used as useful genetic markers to distinguish population in terms of their ethnic affinity.
The earlier studies on the Neo-Buddhist have ignored sub-groups, sub-group endogamy and localized of some specific sub-groups as if they have any influence on the genetic constitution in so far as the process of micro-evolution is concerned. The regional variation that is observed among the Neo-Buddhist in terms of genetic constitution may also need to be seen from the point of the geo-graphical distribution of the sub-group and their origin.

Thus, a glance at the earlier reported studies on the sickle cell among Neo-Buddhist pose more questions and the variations in this frequency could either be due to--
(a) The selective advantage enjoyed by this gene probably leading to its uneven distribution among them across the state.
(b) The variable disease course due to sickle cell gene is associated with other genetic disorder.
(c) Above all, the different sub-groups of Neo-Buddhist might have the sickle cell gene in variable frequencies (but earlier studies have so far ignored this aspect).
(d) Cultural practice like mating pattern, migration, endogamy etc. play an important role to maintain the gene within and between the population, so in view of the above things and in-depth genetic study and population structure among the Neo-Buddhist subgroup covering a few genetic markers (A1A2BO, Rh (D)) blood groups, sickle cell disorder in addition to beta-thalassaemia and G-6Pd deficiency are taken for the purpose.

In the present investigation genetic study and population structure with reference to haemoglobinopathies have been studied among the Neo-Buddhist, a Scheduled Caste population of Nagpur city, Maharashtra.

The study area is whole Nagpur city includes urban and rural Nagpur called Nagpur city. The predominant Scheduled Caste group is Neo-Buddhist which was earlier called Mahar, owing to Dr. Ambedkar’s social reform movement, the Mahar who now prefer to call themselves Neo-Buddhist have undergone a major social changes especially in matter related to religion, marriage etc. The different Neo-Buddhist subgroups used to maintain subgroup endogamy, but this practice is on the wane and the subgroups are opening up for inter-marriage. This community is reported to have more than fifty subgroups.
In Nagpur, four major subgroups of Neo-Buddhist are residing. This Scheduled Caste community having nine percent of the total population, spread in almost all the district and are present in most of the villages of Maharashtra.

A total of 603 unrelated Neo-Buddhist were randomly selected from thirteen locations namely Indora, Ganeshpeth, Dharampeth, Navneet Nagar (Wadi), Lavha, Waditakli, Hingna, Imam Wada, Dhammkirti Nagar (Wadi), Amar Jyoti Nagar (Jaripatka), Anand Nagar (Sitabuldi), Ambedkar Nagar (Wadi), Bhankheda of Nagpur city and a total of 216 extended genealogies from the available sub-groups were collected to understand their population structure using structured schedule covering demography and couple information.

3-5 ml intravenous blood was collected in EDTA medium from the cubital vein with a prior consent of the subjects. The samples were screened for sickle cell status and Beta thalassaemia status by cellulose acetate electrophoresis in alkaline buffer (ph.8.9) after Dacie and Lewis (1984). The HbA2 Quantitation is done by elution method at 413nm using spectrophotometer and HbF was quantitated by one minute denaturation technique of singer after Chernoff and Singer (1958). Only Male samples were screened for G6PD deficiency status by fluorescence spot test after Beutler et al (1979). Sero-genetic markers like A1A2BO, Rh (D) and Rh (Five serum) blood groups were tested using their respective anti-sera with suitable controls after Race and Sanger (1968).

Further more, statistical constants for all quantitative parameters are derived. Population structure models based on empirical data derived. After field work on Mating structure and suitable to Indian situation were adopted.

To summing up the observations, it may be concluded from the demographic profile and population structure:

1. Nuclear families are higher (73.61 %) as compared to joint families (20.83 %) and broken families (5.56 %).
2. Medium families are much more dominant (69.45 %) as compared to small (34.81 %), large (12.96 %) and very large families (2.78 %).
3. As the age increases the number of individuals gradually increases among the males and females in the lower age group, however, in the higher age group a reverse trend is evident. In all the subgroups a low percent of infant and child mortality is recorded, which might be due to the advantage of urban residence of the study population.

4. Percentage of individual is higher in the pre-reproductive (male-39.48, females-37.12) and reproductive (male-53.4, females,57.20) age groups, whereas, post reproductive age group exhibits very low percentage of individuals (males-7.12, females-5.68).

5. The index of aging (37.2 %) is found to be high, which might be due to the lower rate of mortality in the study population. Child women ratio among them is 158.23 per 1000, which indicates an increasing trend of fertility. Young dependency ratio is found to be 65.08 percent, while total dependency ratio is 69.51 percent.

6. The highest percent (17.32%) of child less mothers are found among the Bawne, while among the Ladwan lowest percent (2.41) of child less mothers is found. Mean of live births ranges between 3.54 and 3.91 in these four subgroups. However, percent of pregnancy wastage (abortion and still births) ranges between 2.23, in the Kosare to 5.19, in the Bawne. Neo-natal mortality (0-31 days) is recorded to be highest (6.44%) among the Bawne and lowest (1.88%) among the Ladwan, among the Kosare and Barke an intermediate value is recorded. Percent of post natal mortality however, does not exceed 1.29 among these subgroup. Side by side a very low percent of child (1-6 yrs), pre-adolescent (7-12 yrs) and adolescent (13-18 yrs) are recorded among them.

7. The Bawne shows highest percent (1.05) of reproductive wastage among these four subgroups, however, among the Ladwan lowest percent (0.44%) of reproductive wastage is reported. Infant mortality is found to be highest (7.6 %) among the Bawne and lowest (2.65 %) among the Barke. Among the Kosare (4.25 %) and Ladwan (3.09 %), however, an intermediate value is recorded.
8. Total mortality is highest among Bawne i.e. (8.82 %) followed by Kosare (7.96 %), Barke (5.25 %) and Ladwan subgroup (5.07 %). Whereas, overall total mortality among Neo- Buddhist is found to be 6.91 percent. Infant mortality is much higher among Bawne subgroup (6.54 %) followed by Kosare (3.82 %), Barke (2.68 %) and Ladwan (2.15 %). Whereas, overall total infant mortality is found to be 4.03 percent among Neo-Buddhist as a whole.

9. Mortality among first born is found to be 10.15 percent.

10. The average number of live births per married women for all age group for Ladwan subgroup (3.81 %) followed by Kosare (3.69 %) Barke (3.60 %) and Bawne (2.93 %). Whereas, among Neo-Buddhist is 3.4 percent.

11. Total 2917 children were born to 788 mothers of all ages and 209 (7.17 %) are dead among Neo- Buddhist as a whole. And infant mortality (0-1 year) is much higher among all the subgroups, whereas, sporadic mortality is found among all other age groups. However, adulthood mortality is fewer among them than the infant.

12. Among Bawne the percent of never pregnant women is higher below 24 years of age women than 25-34 years of age women and opposite picture is observed among other subgroup.

13. Mean number of live births per mothers aged 45 and above is 5.22 percent among Barke subgroup followed by Kosare (5.17 %), Ladwan (5.04 %) and Bawne (4.65 %), whereas, total among Neo- Buddhist is 5.01 percent. The premature deaths is found to be 0.0766 among Bawne subgroup followed by Kosare (0.0531), Ladwan (0.0356) and Barke (0.0325), whereas, this value is 0.0493 among the total Neo-Buddhist.

14. The finding of selection intensity clearly indicates that the index of total opportunity for selection among the Neo-Buddhist subgroup is operating with moderate intensity.

15. The Neo-Buddhist are similar in terms of number of children per mother, to those of Bathada, a scheduled caste from Karnataka, Dorla, a tribe from Madhya Pradesh and Dhurwa, a tribe from Madhya Pradesh and Singpho, a scheduled caste from Arunachal Pradesh, whereas, lesser number of children
per mother is found among Lohar Gadiya, a nomadic tribe from Madhya Pradesh, Ladiya, a scheduled caste from Madhya Pradesh and Brahmin, from Assam in comparison to present study.

16. The index of total opportunity for selection among the Neo-Buddhist subgroup as well as among those of Lohar Gadiya, a nomadic tribe and Ladiya, a scheduled caste from Madhya Pradesh, Jacinta, a tribe & Punjabi Sonar, from Meghalaya is operating with moderate intensity, are similar.

17. Mean age at marriage among Barke is 19.09 followed by Bawne (18.7), Kosare (18.57) and Ladwan (17.05). Whereas, among the total population is 18.46.

18. Mean age at first birth among Kosare is 20.66 followed by Bawne (20.52), Barke (19.88), and Ladwan (19.38). Whereas, among total population is 20.16.

19. Mean age at menarche is 15.48 among Kosare subgroup followed by Bawne (15.41), Barke (15.24) and Ladwan (14.96). Whereas, it is 15.61 among total population.

20. Mean age at menopause is 45.67 among Kosare subgroup followed by Barke (45.32), Bawne (45.16) and Ladwan (44.2), whereas, it is 45.06 among total population.

21. Nagpur city endogamy (marriages took place with in Nagpur city) is found to be 55.26 percent among Barke subgroup, followed by Bawne (50.46), Ladwan (46.99) and Kosare (44.38). Whereas, 49.83 percent among the total population. It is interesting that out of Maharashtra, exogamy is found highest 19.45 percent only among Bawne subgroup followed by Kosare (10.06), Ladwan (2.41) and Barke (0.91). Whereas, it is 9.85 percent among total population.

22. Mean marital distance is found to be 57 SD 106.92 among Bawne subgroup followed by Kosare (55.16 SD 102.59), Ladwan (41.73 SD 61.08) and Barke (31.85 SD 53.65). Whereas 47.35 SD 87.82 is found among the total population.
23. Intra subgroup endogamy is found to be 92.24 percent over generations among the Barke subgroup followed by Kosare (91.71%), Bawne (89.36%) and Ladwan (84.33%). Whereas, 89.58 percent is observed among total population. However, a gradual decline in frequency of intra subgroup marriages is noticed over generations among all the subgroups. Percent frequency of mating between GIII and GII are significant at 5 percent level among neo Buddhist population as a whole.

24. Maximum preference is given to subgroup endogamy than within population and it is clear from the observation that marriages with nonNeo-Buddhist are negligible (0.56%). The percent endogamy is 37.16 among Bawne followed by Barke (25.54%), Kosare (19.60 %) and Ladwan (17.7 %).

25. The subgroup endogamy is higher 92.24 percent among Barke subgroup followed by Kosare (91.71), Bawne (89.36) and Ladwan (84.34%). whereas, among total population show 99.21 percent population endogamy. Only 0.79 percent population exogamy is seen among the Neo -Buddhist.

26. Only mother’s brother’s daughter (MBD) marriages are found to be 2.37 percent among present population as a whole. The average coefficient of inbreeding is observed to be 0.0015.

27. The Z value paired sub ethnic difference in subgroup endogamy between the subgroup pairs that Bawne shows insignificant difference with Barke, Kosare and Ladwan at 5 % level and Barke shows insignificant difference with Kosare. Whereas, Barke shows significant difference with Ladwan. And Kosare shows significant difference with Ladwan at 5 percent level.

Thus in fine it can be stated that nuclear families are predominant among the Neo-Buddhist subgroups, side by side there is a preponderance of medium size of families among them. As the age increases the number of individuals gradually increases among the males and females in the lower age group, however, in the higher age group a reverse trend is evident. In all the subgroups a low percent of infant and child mortality is recorded, which might be due to the advantage of urban residence of the study population. The opportunity of natural selection is found to be operating with moderate
intensity among these subgroups. The values of which ranges between 0.207- 0.380. Average age at marriage is found to be highest among Barke (19.38) and lowest among the Ladwan (17.05) but when the mean of live births is taken into consideration a different trend is noticed. Which is highest among Barke than that of the Ladwan? The age at menarche shows no remarkable differences among the subgroups, which ranges between 14.96-15.48. Side by side, in case of menopause, no remarkable difference is noticed, out of state endogamy is found to be highest among the Bawne and lowest among the Barke and Kosare than that of the Bawne and Ladwan. Marriages with non Neo-Buddhist are negligible among these subgroups. When the consanguineous marriages are taken into consideration only MBD marriages are noticed among the subgroups. The Ladwan shows significant differences with the Kosare and Ladwan in terms of subgroups endogamy.

To summing up the observations, it may be concluded from the findings of Sickle cell disorder, G-6PD deficiency, Beta thalassaemia and Blood groups:

1. The maximum occurrence of HbS disorder is concentrated in Sitabuldi area of Nagpur city.
2. Females are more affected by HbS disorder than their counterparts in the study population.
3. The Bawne are most affected by HbS disorder and the Kosare are the less affected by HbS disorder among these four subgroups.
4. Like phenotypic frequency distribution in case of gene frequency also Bawne shows the highest representation and the Kosare the lowest.
5. Expected number of HbS heterozygote is much higher than the homozygote, which is true for the present sample and the Neo- Buddhist of Nagpur city as a whole also.
6. The frequency ranges of HbS disorder is comparatively higher among the Neo-Buddhist subgroups that of Neo-Buddhist reported earlier.
7. The frequency of HbS disorder ranges from 0 to 33.6 percent among the other population of Maharashtra.
8. The occurrence of marriages among normal males and females are much higher than other categories like normal males vs. HbAS females, HbAS vs. normal females, HbAS male vs. HbAS females.

9. The highest occurrence of HbAS is noticed in 25-35 yrs age group among the males, and females, both. However, in case of HbSS, very few cases are found in both the sexes.

10. The HbS heterozygote is found in lower frequency in group I and III peak but in higher frequency in group II peak.

11. There exists no definite trend in case of these three peaks among the Neo-Buddhist as a whole for all hematological parameters.

12. In case of quantity of HbAS no definite trend is noticed.

13. Only 7 (1.17%) cases of HbSS (homozygote) are found in the study population.

14. Mean value of white blood cells (WBC), red blood cells (RBC), haemoglobin (HGB) and haematocrit (HCT) are comparatively higher among the normal males, whereas mean values of mean cell volume (MCV), mean corpuscular haemoglobin (MCH) and mean corpuscular haemoglobin concentration (MCHC) are comparatively higher among the affected males than their counterparts. Side by side among the females, higher mean value is recorded for WBC, RBC, HCT, MCV, and MCH among the affected females, whereas among the normal males higher mean values are recorded for HGB and MCHC than their counterparts.

15. From the result of “t” value it is observed that normal and affected males differs significantly for HCT, side by side normal and affected females differs significantly for MCHC. It is said from the observation of “t” value that there is difference between normal and HbAS in terms of hematology.

16. In the present study mean peak value for HbS is higher in the entire three groups (I, II, III) when it is compared with Rao’s study (1988). But when it is compared with other country’s study, is almost similar.

17. The large variability observed with respect to HbS frequency in the tribal population may be due to interaction of alfa-tahlassaemia and malaria
endemicity, besides other factors like population size, distribution and mating pattern also play an important role in the maintenance of these genes in the population.

18. The disease course pattern is severe for homozygote for HbS among them.

19. Mean HbA2 quantity (5.26 + - 1.02) and mean HGB quantity (12.05 + - 1.59) is observed among the total of six samples, which indicates a slightly lower value for HGB. It is interesting to note that out of six samples, carrier for beta thalassaemia, one is double heterozygote i.e. carrier for sickle cell as well as beta thalassaemia.

20. Only 06 (0.99 %) cases of Beta thalassaemia trait were detected. No case of Beta thalassaemia homozygote could be observed. The highest frequency of Beta thalassaemia trait was observed among Bawne subgroup 4(1.57%) followed by lad wan (1.89%). No case of Hb beta thalassaemia could be observed between Barke and Kosare subgroup. The Hardy Weinberg chi-square test for goodness of fit is insignificant for Bawne and Ladwan subgroup. The Chi-square test of homogeneity among all the subgroups is also insignificant. Only one case of double heterozygote could be observed in the present study.

21. The Ladwan shows the highest Beta-thalassaemia gene frequency (0.0078) Followed by Bawne (0.01). Where as 0.005 is found among total Neo-Buddhist population.

22. Only one study is on Mahar so far from Aurangabad District and 5 cases of HbAS + beta thalassaemia trait (Double heterozygous) is reported among the population. No case of only for beta thalassaemia is observed.

23. The higher frequency of beta thalassaemia is reported among Halai Lohana (17.24 %) from Bombay in Maharashtra.

24. Only 2 cases (0.67 %) of G6PD enzyme deficiency among Bawne subgroup were detected. Chi–Square homogeneity test among all the subgroup are insignificant.

25. The gene frequency of G-6PD is 0.1290 among Bawne, whereas, among total Neo Buddhist population is 0.0820.
26. The highest percent frequency of G6-PD is 10.9 percent observed from Aurangabad district of Maharashtra.

27. The highest frequency of G-6pd deficiency is 17.3 percent observed among Gonds (male) from Nagpur district followed by Parsi from Poona district, Madia from Chanda district, Bhanushal from Bombay district and Mahar from Aurangabad district.

28. The Bawne and Lad wan subgroup show Common trend of high O blood group than B, A and AB. Whereas, Kosare subgroup show High O than A, B and AB, and Brake show high B than O, A and AB. A2 phenotype is highest among the Bawne subgroup followed by Lad wan, kosare and Barke. The gene frequency data shows that Neo – Buddhist of Nagpur city has high O gene frequency (0.6096) and low A2 gene frequency (0.0376). Similarly, all the subgroups show high O gene frequency and low A2 gene frequency.

29. Hardy Weinberg Chi-square test for goodness of fit is insignificant for all the subgroup and chi square test of homogeneity is also insignificant for blood groups among all the subgroup.

30. In terms of A1A2BO blood groups, almost similar pattern is noticed among all the study population (Mahar) with comparison to present study.

31. In Rh (D) blood Group except Barke, all three subgroup show the presence of Rh (d) phenotype, which is high in Kosare (2.42). In average 98. 61 percent of the Neo – Buddhist are positive for the Rh (D) allele (gene frequency is 0.9000502)

32. Chi-square test for homogeneity for Rh (D) blood group among all the subgroups is insignificant.

33. No case of Oh blood group could be observed in the present study.

34. So far only seven studies on Rh(D) blood group including present study has been carried out among Neo- Buddhist population and the highest frequency of Rh (d) Phentype is reported among Buddha of Ratnagiri district (3.393 %).

35. The highest (41.67%) frequency is observed for Cde / Cde among the Neo-Buddhist as a whole followed by Cde / cDe, cDE / CDE, and others. The chi square homogeneity test among all the subgroups is insignificant.
36. R1 high gene frequency (0.482) is observed followed by Ro (0.34), Rz (0.0163) and R2 (0.016) for Rh – five subtypes.

37. So far only three studies have been carried out on Rh-5 subtypes among the study population and found a highest frequency of CcDee followed by CcDee, ccDEe and others.

38. Pair wise chi-square test for homogeneity difference is insignificant with in and between subgroup for the entire locus.

39. Chi-square homogeneity test for all the subgroups is also insignificant for A1A2 B0, Rh (D), HbS, G6PD and Beta thalassaemia locus.

40. The Bawne subgroup has the highest (H) value (0.27249) followed by Ladwan (0.21055), Kosare (0.21008) and Barke (0.17221) for average heterozygocity (H) for all loci.

41. Total genetic diversity (Ht = 0.21978) across the Neo – Buddhist population is indicating that with in subgroup genetic differentiation (Hs = 0.21634) to be the prime factor, rather than the between subgroup (Dst = 0.00344) genetic differentiation. Whereas co efficient genetic differentiation is found to be (Gst = 0.01565) and average gene differentiation is found (Fst = 0.035)

In connection with the present study blood samples were collected for HbS, beta thalassaemia, G6-PD deficiency and blood groups from different localities of Nagpur city. Higher frequency of HbS is reported at Sitabuldi area in the city. Frequency of HbS is found to be 25.86 % among the Neo-Buddhist population as a whole, in which frequency of males is slightly lower (24.08%) that of the females counterparts (25.32%). when the frequency of HbS is considered at subgroups level, it is found that the Bawne are most affected by this disorder. However, the frequency of HbS in the study population is found to be slightly higher than that of the earlier studies.

In the study population altogether 06 (0.99%) samples were detected to be carriers for beta thalassaemia, in which one is double heterozygote i.e. carrier for HbS as well as beta thalassaemia. The Bawne shows the highest number 4 (1.57%) of beta thalassaemia than that of the other subgroup. However, the Ladwan (0.01) shows the highest gene frequency that followed by the Bawne (0.0078). When the beta
thalassaemia frequency of the present study is compared with other Maharashtrian population, it is found that the Halai Lohana from Bombay have the highest frequency of this gene.

G6-PD deficiency frequency is found to be (0.0820) as a whole in the Neo-Buddhist population. It is interesting to note that only two cases of G6-PD deficiency were detected among the Neo-Buddhist, which is present among the Bawne. In comparison with other studies on Neo-Buddhist (Mahar) in these aspects it is found that the study population has lesser phenotypic frequency of G6-PD than others.

The blood groups gene frequency shows that the Neo-Buddhist have high O gene frequency and low A2 gene frequency, which is true for all the subgroups. In average 98.61% percent of the Neo-Buddhist are found to be positive for the Rh (D) allele. However, no case of oh blood group could be observed in the present samples. When the pair wise chi square homogeneity difference is calculated, it is found that there is no significant difference within and between subgroups for these entire locus.

There are few anthropological study of Neo- Buddhist are available but in subgroup level there is no such study conducted in physical anthropology among this population group. Neo-Buddhist community is divided in to several subgroups on the basis of their place of birth, marital pattern etc. They are mainly found in Central, West Central and Western India. Further, there is internal movement especially marital migration to different places, which has brought about wide and random dispersion among this population. The present study is divided in to two parts viz. population structure and genetic markers, which is undertaken among the four subgroups of Neo-Buddhist namely Bawne, Kosare, Barke and Ladwan residing in Nagpur city. These subgroups were sorted out on the basis of marital pattern. It is concludes from the findings that Nuclear families are predominant among the Neo-Buddhist subgroups, side by side there is a preponderance of medium size families among them. Mean age at marriage ranges between 14.96-15.48 yrs. among the subgroups. Opportunity of natural selection ranges between 0.207-0.380 among them. The State endogamy is found to be highest among the Bawne subgroup (19.45) and lowest among the Barke.
Marriages with non Neo-Buddhist are negligible. In case of consanguineous marriages only mother’s brother’s daughter (MBD) marriages are noticed.

To study the prevalence spread and heterogeneity of HbS disorder as well as G-6PD deficiency, Beta thalassaemia and Blood groups were collected from these subgroups with prior consent. Frequency of HbS is found to be 25.86 percent as a whole among the Neo-Buddhist. In subgroup level the Bawne are mostly affected by this disorder. Only 06 (0.99 %) samples were detected for beta thalassaemia, in which, one is double heterozygote, i.e., carrier for HbS as well as Beta thalassaemia. The Bawne shows the highest number of beta thalassaemia. Frequency of G-6PD deficiency is found to be 0.082 as a whole in the study population. Only two cases (0.33%) of G-6PD deficiency were detected among them, which are present among the Bawne. All the subgroups have high O gene frequency and low A2 gene frequency. In average 98.61 percent of the Neo-Buddhist are found to be positive for the Rh (D) allele. However, no case of Oh blood group is reported in the present study.

In Nagpur, the Neo-Buddhist shows a high HbS frequency with a low significant heterogeneity among the subgroups. However, the Bawne occupy the highest position than the rest of subgroups. Side by side, G-6PD deficiency is found only among this subgroup. Beta thalassaemia is reported among the Bawne as well as Ladwan and insignificant difference is noticed for all the loci among these subgroups when pair wise chi-square homogeneity test is performed. Average heterozygocity among the Bawne is quite high. Total genetic diversity is indicative of intra subgroup genetic differentiation is to be the prime factor.

The Kosare and Barke placed in the same cluster in terms of distribution of endogamy and sickle cell trait, whereas two subgroups are placed individually. However, as a whole are making a single cluster. It reveals that subgroups of Neo-Buddhist in Nagpur city are genetically not differentiated but the difference in intra subgroup level is due to the preferential intermixing among them.

In the present study an increase of marriages with in Nagpur city is found among the subgroups. Finally, it can be said that HbAS frequency may increase among these subgroups if there is favorable selection pressure exists.
The present study will serve as a primary source of basic set of data to evaluate the
effects and monitor the processes, which is of immediate urge to be implemented on
Neo-Buddhist in general and also will be useful for academicians, researchers,
planners, health professionals and non government organizations, those are working for
upliftment of health status of the scheduled caste and scheduled tribe populations.