Trends in Life Sciences
An International Peer-Reviewed Journal
www.sciencejournal.in

# TO STUDY THE HEMATOCRIT (HCT) PERCENTAGE IN THALASSEMIA PATIENTS FROM SOLAPUR DISTRICT, M.S., INDIA

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**ABSTRACT**
Thalassaemia is the name of a group of genetic, inherited blood disorder passed down through families in which the body makes an abnormal form of hemoglobin. The disorder results in excessive destruction of red blood cells, which leads to anemia.

**KEY WORDS:** Inherited blood disorder, Pre and post blood transfusion, HCT Count, Thalassemia.

## INTRODUCTION

The name thalassemia derived from a combination of two Greek words: *thalassa* meaning the sea (Cooley *et al.*, 1925, 1927; Bradford and Dye, 1936) that is the Mediterranean and anemia ("weak blood"). Another term found in literature, although infrequently, is Cooley's anemia and it was believed to be endemic (Cooley's Anemia Foundation, 2010). India is a large Southeast Asian country with a population of over one Billion. About 6,000 children are born with thalassemia major each year, more than 30% of births with a major thalassemia syndrome in South East Asia (Modell and Petrou, 1983). Madan Sharma *et al.* (1998) observed that 10% of the World incidence of Thalassemia. In India, prevalence of Thalassemia is very high in Punjabi, Sindhi, Gujarati, Bengali, Parsee, Lohana and certain tribes community, i.e. Northern, Western and Eastern parts, while it is much less in the south of India (Shah, 2004).

In major β-thalassemia patients, on blood transfusion regimen, the hemoglobin and hematocrit level is a significant factor on determination of prognosis.The purpose of this study is to determine HCT % in thalassemic children from Solapur District, Maharashtra State, India during August-2008 to July 2010.

## MATERIALS AND METHODS

Present survey of one hundred twenty five (Male =73, Female =52) clinically proved cases of Thalassemic children's of age group 6 months to 18 Years coming from different parts of Solapur district, Maharashtra State. Blood samples of these children were collected twice- first before blood transfusion and after receiving blood transfusions. Test for HCT was carried out from each transfusion.

The entire survey was carried out under the observations of Medical expert from Thalassemia transfusion centre, Indian Red Cross Society, Gopabai Damani Blood Bank, Solapur Maharashtra, India. The study population consisted of one hundred twenty five, cases of Thalassemic children receiving regular blood transfusions in the following blood banks and hospitals collaborating in this multicentre study, with prior written consent from the parents/ guardians.
1) Indian Red Cross Society, Gopabai Damani Blood Bank, Thalassemia Centre, Solapur.
2) Hedgewar Blood Bank, Solapur
3) M/s Indian Red Cross Society Blood Bank, Sub Branch Sou Sarjubhai Bajaj Blood Bank, Pandharpur, District- Solapur.
4) Shriman Rambhai Shah Blood Bank, Sub Branch, Indian Red Cross Society, Barshi, District- Solapur.
5) Chatrapati Shivaji Rugnalaya, Government Hospital, Solapur.

**Sample collection:** Whole blood samples of 125 Thalassemia patients were collected in EDTA in plain bulb. Information of each patient regarding their age, sex, ethnic group, transfusion started and clinical appearance was noted at the time of sample collection. Five milliliter of venous blood was collected every time in a plain glass test-tube from each subject. The sera and plasma were separated for cross matching and analysis for further study (Freundlich and Gerarde, 1963; European Committee for Clinical Laboratory Standards, 1984).

### Hematological Parameters

Hematological parameters: HCT counts were measured using Sysmex cell counter (Wild and Bain, 2001).

  

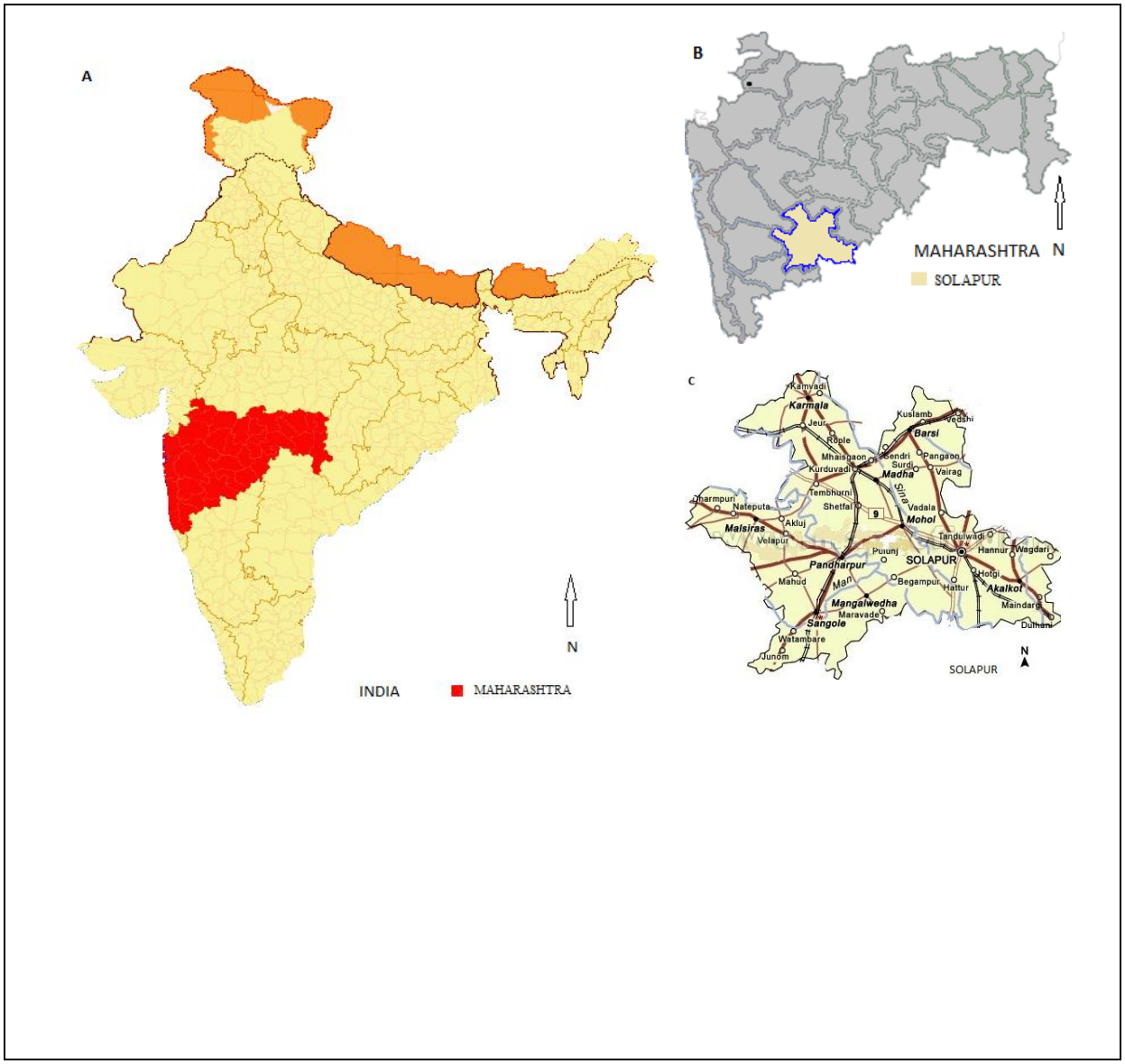


**Figure- 2. Map.**

**A- India;**

**B- Maharashtra State,**

**C- Solapur District**

## RESULTS AND DISCUSSION

The results of HCT (Hematocrit or Pack cell volume) % were shown in Table 1 to 3 and Figure 1

**Table-1.** Showing the normal reference value of HCT.

| Parameters | Age | Normal range male | Normal range female |
|---|---|---|---|
| HCT | 6 months to 18 Years | 45-62% | 37-48% |

  

**Table-2.** Showing the HCT % in the thalassemic patients.

| Patient's Code | HCT % | Patient's Code | HCT % | Patient's Code | HCT % | Patient's Code | HCT % |
|---|---|---|---|---|---|---|---|
| 1 | 29.2 | 33 | 25.9 | 65 | 25.56 | 97 | 23.13 |
| 2 | 22.83 | 34 | 19.83 | 66 | 21.83 | 98 | 23.66 |
| 3 | 18.8 | 35 | 28.5 | 67 | 28.23 | 99 | 25.46 |
| 4 | 24.4 | 36 | 23.76 | 68 | 24.2 | 100 | 19.36 |
| 5 | 31.23 | 37 | 27.86 | 69 | 26.4 | 101 | 27.03 |
| 6 | 26.56 | 38 | 21.7 | 70 | 22.66 | 102 | 20.5 |
| 7 | 21.2 | 39 | 28.7 | 71 | 21.16 | 103 | 20.8 |
| 8 | 29.86 | 40 | 24.06 | 72 | 21.7 | 104 | 21.7 |
| 9 | 21.26 | 41 | 29.5 | 73 | 24.7 | 105 | 20.66 |
| 10 | 22.8 | 42 | 25.3 | 74 | 25.16 | 106 | 23.3 |
| 11 | 18.1 | 43 | 25.23 | 75 | 19.3 | 107 | 28.4 |
| 12 | 19.56 | 44 | 24.8 | 76 | 27.26 | 108 | 16.5 |
| 13 | 22.56 | 45 | 23.66 | 77 | 20.46 | 109 | 21.9 |
| 14 | 19.6 | 46 | 25.73 | 78 | 19.4 | 110 | 21.5 |
| 15 | 21.43 | 47 | 18.33 | 79 | 22.93 | 111 | 22.5 |
| 16 | 20 | 48 | 25.83 | 80 | 18.53 | 112 | 19.96 |
| 17 | 25.76 | 49 | 21.03 | 81 | 23.26 | 113 | 22.1 |
| 18 | 29.4 | 50 | 23.93 | 82 | 21.76 | 114 | 17.73 |
| 19 | 22.96 | 51 | 22.9 | 83 | 31.53 | 115 | 16.63 |
| 20 | 26.96 | 52 | 21.3 | 84 | 21.3 | 116 | 26.1 |
| 21 | 22.96 | 53 | 20.16 | 85 | 15.23 | 117 | 22.3 |
| 22 | 22.9 | 54 | 26.73 | 86 | 25.06 | 118 | 22.8 |
| 23 | 20.46 | 55 | 26.2 | 87 | 23.43 | 119 | 21.93 |
| 24 | 22.73 | 56 | 21.73 | 88 | 18.8 | 120 | 11.03 |
| 25 | 25 | 57 | 33.63 | 89 | 24 | 121 | 20.53 |
| 26 | 21.86 | 58 | 23.9 | 90 | 24.5 | 122 | 20.8 |
| 27 | 21.7 | 59 | 30.6 | 91 | 20.8 | 123 | 24.56 |
| 28 | 29.26 | 60 | 22.56 | 92 | 18.33 | 124 | 14.76 |
| 29 | 25.7 | 61 | 20.23 | 93 | 16.83 | 125 | 18.46 |
| 30 | 27.5 | 62 | 25.3 | 94 | 20.3 | | |
| 31 | 25.46 | 63 | 29 | 95 | 18.36 | | |
| 32 | 24.23 | 64 | 28.03 | 96 | 24.86 | | |

In all type of thalassemic patients HCT count was very low. Not a single patient was with normal or with high HCT.

  

**Table-3** Showing the prevalence percentage of HCT count in thalassemia patients.

| Types of Thalassemia | Sex (Total patients) | HCT (%) | | |
|---|---|---|---|---|
| | | Normal | High | Low |
| **SCT** | M (1) | 00(00.00) | 00(00.00) | 1(100.00) |
| | F (0) | 00(00.00) | 00(00.00) | 00(00.00) |
| | Total | 00(00.00) | 00(00.00) | 01(100.00) |
| **BTI** | M (12) | 00(00.00) | 00(00.00) | 12(100.00) |
| | F (4) | 00(00.00) | 00(00.00) | 04(100.00) |
| | Total (16) | 00(00.00) | 00(00.00) | 16(100.00) |
| **BTMi** | M (6) | 00(00.00) | 00(00.00) | 06(100.00) |
| | F (4) | 00(00.00) | 00(00.00) | 04(100.00) |
| | Total (10) | 00(00.00) | 00(00.00) | 10(100.00) |
| **TM** | M (54) | 00(00.00) | 00(00.00) | 54(100.00) |
| | F (44) | 00(00.00) | 00(00.00) | 44(100.00) |
| | Total (98) | 00(00.00) | 00(00.00) | 98(100.00) |
| **Total patients** | M (73) | 00(00.00) | 00(00.00) | 73(100.00) |
| | F (52) | 00(00.00) | 00(00.00) | 52(100.00) |
| | Total M+F (125) | 00(00.00) | 00(00.00) | 125(100.00) |

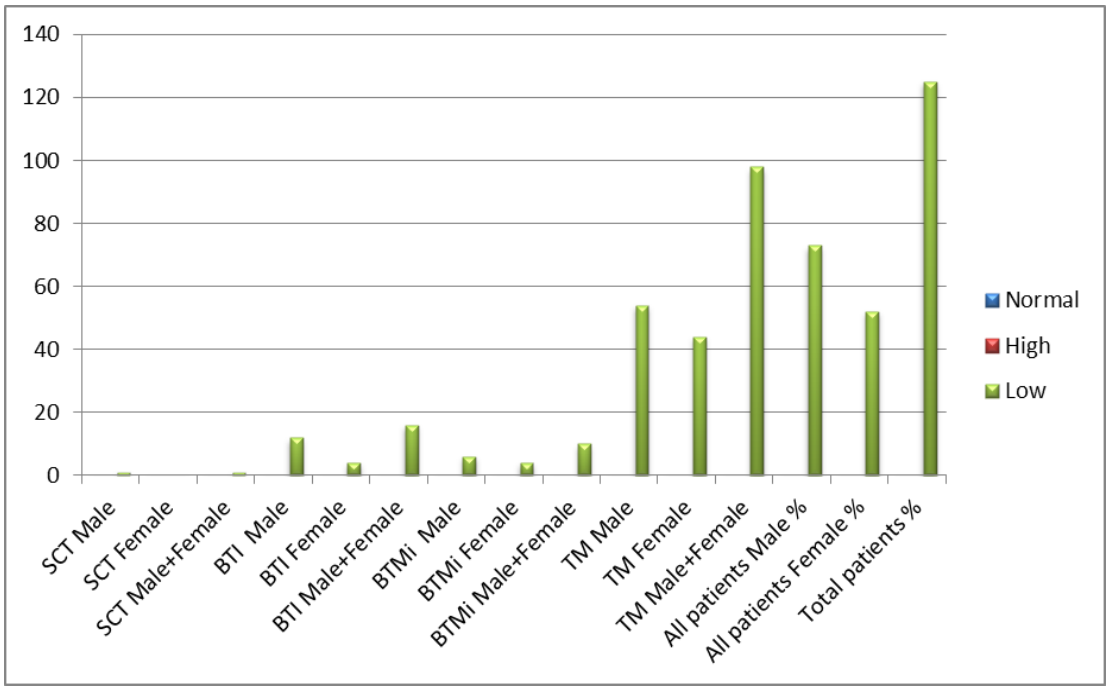


**Figure-2.** Showing the prevalence percentage of HCT count in thalassemia patients.

All thalassemic patients' hemoglobin, HCT % count was very low as compared to previously reported by Thomas (1998), not a single patient was observed in normal and with high range. The goal for future research in thalassemia is not only to introduce new strategies of diagnosis and treatment of thalassemia but also to discover ways to prevent transfusion-induced malaria, HCV, HIV, HBsAg, VDRL and other complications in thalassemic patients. Present research work was helpful for extending knowledge of the thalassemia, its prevention and treatment. It may also prove useful for policy makers, health professionals, patients and parents, and the community at large.

  

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