ORIGINAL RESEARCH PAPER
Volume - 12 | Issue - 07 | July - 2023 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

MENTZER INDEX AS A SENSITIVE MARKER TO DETECT BETA THALASSEMIA TRAIT.

Hematology

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ABSTRACT

Introduction: Thalassemia is the most common genetic disorder in the world. Individuals with beta Thalassemia trait (BTT) are usually asymptomatic and may be unaware of their carrier status . Hb electrophoresis is done for confirmation but other cost effective hematological indices are also used. This study is done to assess the sensitivity of Mentzer index in the detection of BTT and Iron deficiency anemia (IDA). **Methodology:** study was done on 108 cases with MCV <80fl for a period of 6 months. Iron profile was done on all and patients with low iron and ferritin were diagnosed as IDA group and rest as non IDA group .RBC parameters were studied and Mentzers index (MCV/RBC) was calculated. If Mentzers index is less than 13 , it suggest BTT and more than 13 suggested IDA .BTT cases were further confirmed by HbA2 - >3.5 by HPLC. **Result:** Out of 110 cases 89 had MI >18 and IDA was confirmed in 88 out of 89 cases.21 cases had MI< 13 and btt was confirmed in 18 cases.Thus Mentzer index ha ssensitivity and specificity of 96% and 85 % for IDA and 94% and 96 % for BTT. **Conclusion:** Mentzer index can be used a s a useful and cost effective screening tool to detect beta thalasemia trait and to differentiate it from IDA .

KEYWORDS

Mentzers index, Beta Thalassemia Trait, Iron deficiency anemia.

INTRODUCTION:

Thalassemia is a disorder caused by the decrease or absence in synthesis of one or more globin chains of haemoglobin . [1] Beta Thalassemia trait is the most common type of heriditary hemoglobinopathy .Individuals with beta Thalassemia trait are usually asymptomatic and may be unaware of their carrier status unless diagnosed by testing using Hb electrophoresis. Microcytic anemias are among the most common type of anemias encountered by physicians and the most common causes are beta thalassemia trait and iron deficiency anemia Hematological parameters can be used to derive Various indices that can be used to differentiate IDA and BTT.

Indices commonly used are England and Fraser, Mentzer, Shine and Lal, Srivastava, Green and King, Sirdah, RDWI, Ricerca, MDHL, MCHD. [2]Mentzer index is calculated by MCV/RBC.Mentzer index <13 points to diagnosis of BTT & >13 points to IDA.[3]

OBJECTIVE:

Role of Mentzer index as a sensitive marker and cost effective marker for beta Thalassemia trait .

MATERIALS & METHODS :

Study was done on 110 cases with MCV <80fl for a period of 6 months.Iron profile was done on all and patients with low iron and ferritin were diagnosed as IDA group and rest as non IDA group .RBC parameters were studied and Mentzers index (MCV/RBC) was calculated . BTT (MI<13) cases were further confirmed by HbA2 - >3.5 by HPLC.

RESULT:

Out of 110 microcytic anemia cases IDA was confirmed for 91 cases in the mean age of 40yrs and showed female predominance . Cases with normal iron profile was subjected to electrophoresis and grouped as BTT which were around 19 cases in the mean age of 41 yrs and showed male predominance (table 1).

Table 1

Group	Total number	Age range	SEX male	Female
IDA	91	1-80 yrs	38	50
BTT	19	4-75yrs	11	7

For all 110 cases hematological parameters were taken and Mentzer index(MCV/RBC) was calculated (Table 2)

Table 2

Parameter	Average of IDA group	Average of BTT group
Hb (g/dl)	8.55	13.54
RBC 10^6/uL	3.4	6.2
MCV(fL)	72.59	66.38
Mentzer index	24.2	6.91
HbA2%	Not done	4.23

Mentzer index in IDA & BTT (Table 3)

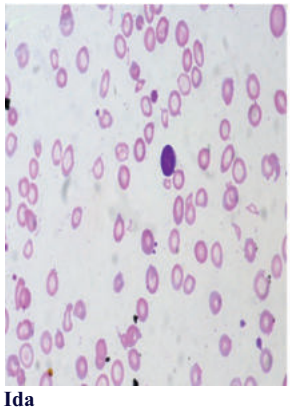
Table 3

Mentzer Index	MI >13	MI<13
IDA	88	3
BTT	1	18

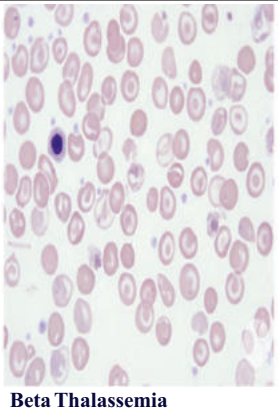
Thus Mentzer index has sensitivity and specificity of 96% and 85 % for IDA and 94% and 96 % for BTT (Table 4).

Table 4

parameter	sensitivity	spec ificity	PPV	NPV
Mentzer index of IDA	96%	85%	96%	85%
Mentzer index of BTT	94%	96%	85%	98%



Ida



Beta Thalassemia

DISCUSSION:

Beta Thalassemia trait is most common form of Thalassemia syndrome seen in india.A general approach for anemia&/or microytosis is iron treatment,this unnecessary therapy in BTT cases will lead to oxidative stress and thereby deteriorate patient . [4] Hence accurate and timely diagnosis of BTT is important and this study is an attempt for the same. It is found Mentzer index has got maximum sensitivity and specificity among all indices. Studies by Ehsani et al ,VehapogluA et al,Sundh A et al also showed Similar results.

3 cases of IDA group which had MI <13 may be attributed to comparitively increased RBC count and further Hb electrophoresis was done and BTT was ruled out.1 case of BTT that had MI >13 had comparitively decreased RBC count and was further confirmed by Hb electrophoresis.

CONCLUSION:

Mentzer index can be used as a useful and cost effective screening tool to detect beta thalasemia trait and to differentiate it from IDA .All cases of microcytosis can be subjected for Mentzer Index before advice for

electrophoresis.This will help for better patient compliance , cost effectiveness and in genetic counciling and testing in families.

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