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Original Research Article

To study the level of serum liver enzymes (SGOT & SGPT) in multitransfused thalassemia major patients

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ABSTRACT

Materials and Methods: This study was conducted on 100 children with β-thalassemia major aged between 1-15 years being regularly transfused at Department of Pediatrics, M.G.M. Medical College, after taking the consent from the parents and explaining them the purpose and method of study.
Result: Mean serum values of ferritin, SGOT, SGPT was found to be 6416.9 $\pm$ 1581.8 μg/l, 205.4 $\pm$ 46.3 u/l and 254.6 $\pm$ 71.7 u/l in patients who received more than 100 transfusions while it was 3784.2 $\pm$1304 μg/l, 104.9 $\pm$ 52.9 u/l, and 131.5 $\pm$ 63.6 u/l respectively for those who receive more than 100 transfusions.
Conclusion: Youngsters with >100 transfusions had serum values of liver enzymes and iron overload higher when contrasted with those with <100 transfusions. The distinction in values between the two gatherings was seen as exceptionally huge (p esteem <0.001) Mean serum estimations of ferritin, SGOT, SGPT was seen as 6416.9 $\pm$ 1581.8 μg/l, 205.4 $\pm$ 46.3 u/l and 254.6 $\pm$ 71.7 u/l in patients who got in excess of 100 transfusions while it was 3784.2 $\pm$1304 μg/l, 104.9 $\pm$ 52.9 u/l, and 131.5 $\pm$ 63.6 u/l individually for the individuals who get less than 100 transfusions.

1. Introduction

Thalassemia is one of the most widely recognized hereditary disorder in pediatric age group.. There are more than 180-250 million β-thalassemia carriers, a huge number of them are from India.[1] Every year approx 1 lac kids are brought into the world with thalassemia major, of which 8000-10000 are diagnosed in India. Thalassemias are the hereditary issue of globin chain creation. In people with β-thalassemia, there is either a total absence of β-globin chain or fractional reduction.[2]

Present work is being done with an aim to assess the effect of multitransfusion on various organs through estimation of SGOT, SGPT, serum ferritin, GTT, so that corrective measures can be adopted.[3]

Despite the fact that death rates has to some degree diminished throughout the years yet difficulties do exist. The current work was done to evaluate the impact of multiple transfusion on liver and in thalassemic kids by estimating serum ferritin, serum liver catalysts, SGOT and SGPT.[4]

2. Materials and Methods

This prospective study was conducted in the department of pediatrics, M.G.M. Medical College, Indore at C.N.B.C and M.Y. hospital & study was conducted between Oct. 2010 and Sept. 2011.

Study was conducted on 100 children with β-thalassemia major aged between 1-15 years being regularly transfused at Dept. of Pediatrics, after taking the consent from the parents and explaining them the purpose and method of study

2.1. Inclusion criteria

1. Child suffering from β-thalassemia major only as confirmed by Hb electrophoresis.
2. Age of thalassemic child should be between 1-15 years.

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3. Attending dept. of pediatrics, M.G.M. Medical College.

2.2. Exclusion criteria

Patient suffering from any major disease like liver disease.

2.3. Estimation of serum SGPT

In our lab, SGPT is evaluated by IFCC (International Federation Of Clinical Chemistry)

Principle –

L-Alanine + 2-Oxoglutarate ———ALT——— Pyruvate + L-Glutamate

Pyruvate + NADH ————————LDH—— L-Lactate + NAD

2.4. Measurement of serum SGPT

In our laboratory, SGOT is estimated by IFCC (International Federation of Clinical Chemistry) method.

Principle –

L-Alanine + 2-Oxoglutarate ———ALT——— Pyruvate + L-Glutamate

Pyruvate + NADH ————————LDH—— L-Lactate + NAD

Sample Pyruvate + NADH ——LDH—- L-Lactate + NAD

2.5. Serum ferritin is estimated by

Chemiluminiscence Method

3. Results

We studied SGOT, SGPT and serum ferritin in 100 multi transfused thalassemia children.

Table 1: Sexwise distribution of cases

Sex	No. of cases	% of cases
Female	48	48%
Male	52	52%
Total	100	100%

Outof 100 cases, 48 were females and 52 were males.

Table 2: Number of blood transfusions and serum ferritin

Frequency of BT	Ferritin (Mean ± SD)	Value
<100	3784.2 ± 1304.0	<0.001
>100	6416.9 ± 1581.8	

Patientswith more than 100 transfusions had ferritin, greater than patients who had transfusionsless than 100 times and this difference was statistically significant (pvalue<0.001)

Table 3: Number of blood transfusions and SGOT and SGPT

Frequency of BT	SGOT (u/l) (Mean ± SD)	SGPT (u/l) (Mean ± SD)	Value
<100	104.9 ± 52.9	131.5 ± 63.6	<0.001
>100	205.4 ± 46.3	254.6 ± 71.7	

Patientswith more than 100 transfusions had serum SGOT, SGPT greater than patients who had transfusionsless than 100 times and this difference was statistically significant (pvalue<0.001)

4. Discussion

This prospective study was conducted in the department of Pediatrics, MGM Medical College, Indore at CNBC & M.Y. hospital. This study included 100 children with β thalassemia major aged between 1 – 15 years, being regularly transfused at department of pediatrics, MGM Medical College

Thalassemia syndrome are a heterogenous group of hereditary disorders of reduced hemoglobin synthesis.[5] Varients show variable degree of anemia with evidence of hemolysis and ineffective erythropoiesis. According to polypeptide globin chain suppression it may be β, α, and delta-β thalassemia. Beta thalassemia is due to suppression of synthesis of beta peptide chain. Beta chain production may be either total, partial or minimally depressed.[6]

Hemolysis occur, due to imbalance in production of globin chain, β thalassemia major is the commonest serious condition which requires regular blood transfusions, aimed at maintaining a minimum hemoglobin level from 9-10gm/dl to above 12gm/dl.[7] Frequent transfusions improve the general well being in patients but carry the risk of iron overload.[7] Excessive iron is then deposited in almost all tissues but primarily in the liver, heart and the endocrine glands and results in their progressive dysfunction.[8]

As iron, the limit of serum transferrin, the primary transport protein of iron, to tie and detoxify iron might be exceeded.[9,10] From that point, the non transferrin bound portion of iron inside plasma may advance age of free hydroxyl radicals, propagators of oxygen related damage[10]. Because of expanded serum ferritin fixation, results might be found as liver illnesses (disturbed liver compounds), pancreatic infections (impairement in glucose digestion) and heart diseases.[11,12]

100 β thalassemia patients, 35 patients have a place with age bunch 1-5 yrs, 43 patients have a place with age bunch 6-10 yrs, and 22 patients have a place with age bunch 11-15 yrs. Of the 100 β thalassemia patients, 48 were females and 52 were guys.[13]

Serum estimation included ferritin, SGOT, SGPT.[14]

Serum ferritin was seen as raised in all the patients of thalassemia considered. It was found to extend from 2000 to 10216ng/ml with a mean estimation of 4363.4ng/ml.

5. Conclusion

In the present study, 100 thalassemic children were studied, of them 48 were females and 52 were males. Serum values of ferritin and liver enzymes were also analysed in thalassemic children based on the number of transfusions. Children with >100 transfusions had serum values higher when compared to those with <100 transfusions. The difference in values between the two groups was found to be highly significant (p value <0.001) Mean serum values of ferritin, SGOT, SGPT was found to be 6416.9 $\pm$ 1581.8 μg/l, 205.4 $\pm$ 46.3 u/l and 254.6 $\pm$ 71.7 u/l in patients who received more than 100 transfusions while it was 3784.2 $\pm$1304 μg/l, 104.9 $\pm$ 52.9 u/l, and 131.5 $\pm$ 63.6 u/l respectively for those who receive more than 100 transfusions. It can be concluded from the present study that increased serum ferritin level, and SGOT and SGPT are associated with multitransfused thalassemic children. serum ferritin concentration which is considered to be a marker for hepatic iron concentration was found to be increased in all the patients.

6. Source of Funding

None.

7. Conflict of Interest

None.

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