ALTERED T AND B LYMPHOCYTES IN MULTITRANSFUSED PATIENTS OF THALASSEMIA MAJOR

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ABSTRACT

T and B lymphocytes were estimated in 25 patients with Thalassemia major to evaluate their immune status. The percentage of T cells was significantly reduced ($p < 0.001$) while that of B cells was significantly raised ($p < 0.001$) in patients of thalassemia major as compared to age and sex matched controls.

Key words: *Thalassemia major, B Cells, T cells.*

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Thalassemics are susceptible to various infections. Attempts to explain possible high frequency of infection in thalassemia (both in non-splenectomized and splenectomized individuals) and its relation to immune status has been the subject of investigation by many workers(1-3). A strong positive correlation has been shown between the proportion of T suppressor cells and increasing transfusion number, in thalassemic patients resulting in depression of cellular immunity(4). B cell function is markedly increased in polytransfused thalassemic patients as indicated by significantly elevated serum immunoglobulin levels(5). However, very little work has been done on T and B cell percentage in thalassemic patients in India. We report here the results of our study.

Material and Methods

Blood samples were collected from 25 established cases of thalassemia major. Blood was collected when the patient came to receive blood transfusion. These patients were free from infection 3 weeks prior to collection of blood. None of these patients was HIV or HBS Ag positive. Three of the 25 patients were splenectomized, 6 months, 4 years and 5 years prior to this study. For controls, the blood samples were collected from 25 patients attending Outpatient Department without any major illness or any blood disorders. The controls were matched for age of thalassemic patients.

Estimation of T lymphocytes in peripheral blood was done by technique used by Froland(6) and Jondal *et al.*(7) with minor modification (E rosette forming cells).

Estimation of B lymphocytes in peripheral blood was done by direct immunofluorescence with FITC conjungated antihuman immunoglobulin by technique used by Froland *et al.*(8).

Results

The mean percentage of T lymphocytes was significantly decreased ($p<0.001$) in all the patients in study group as compared to age and sex matched controls (*Table I*).

The mean percentage of B cells was significantly raised ($p<0.002$) in the study group of 0-4 years compared to control group. In 5-8 and 9-12 years of age groups also the mean percentage of B cells was significantly raised ($p<0.01$) in the study group as compared to control group. Since more than 13 years of age group comprised only one patient each in study and control group, T and B lymphocytes percentage could not be compared statistically.

Mean percentage of T cells was significantly decreased ($p<0.002$) in the splenectomized cases compared to non-splenectomized cases in the study group. Mean T cell percentage was also significantly reduced in splenectomized cases ($p<0.001$) compared to controls. Mean B cell percentage was significantly raised ($p<0.001$) in the splenectomized as well as non-splenectomized cases as compared to controls (*Table II*).

Discussion

The present study was conducted to evaluate the effect of chronic transfusion therapy on the distrbution of lymphoid cell subsets, *i.e.,* T and B cells in the peripheral blood of thalassemic patients.

TABLE I–*Percentage of T and B Lymphocytes in Study and Control Group with Respect to Age*

Age group (years)	T cells: No. of cases (n=25)	T cells: Study group Mean ± SD (n=25)	T cells: Control group Mean ± SD (n=25)	T cells: p value	B cells: No. of cases (n=25)	B cells: Study group Mean ± SD (n=25)	B cells: Control group Mean ± SD (n=25)	B cells: p value
0-4	4	50.3 ± 5.6	70 ± 1.2	<0.001	4	25.5 ± 4.2	14.4 ± 1.1	<0.002
5-8	10	46.2 ± 6.8	68 ± 2.1	<0.001	10	27.3 ± 4.5	14.5 ± 1.4	<0.001
>9	11	43.8 ± 4.7	69.7 ± 2.6	<0.001	11	27.9 ± 3.1	14.4 ± 1.6	<0.002

TABLE II–*Percentage of B and T Lymphocytes in Splenectomized and Non-Splenectomized Cases*

Percentage of lymphocytes	Study group: Splenectomized Mean ± SD (n=3)	Study group: Nonsplenectomized Mean ± SD (n=22)	Control group Mean ± SD (n=25)
T lymphocytes	36 ± 2	46.9 ± 5.1	69.2 ± 2.2
B lymphocytes	34 ± 1	26.4 ±3	14.5 ± 1.3

In all groups difference was highly significant ($p<0.001$)

The maximum number of cases (80%) in the study group were between 5 and 12 years of age. This comparatively higher age group was because all the cases included in the study were multitransfused and the minimum number of transfusions received was 18 units of blood. There was no correlation between number of transfusions and percentage of T and B cells.

As seen in *Table I* the percentage of T cells was significantly reduced in the study group compared to the control group ($p<0.001$) and this was in accordance with other studies(5,9-11). Musumeci *et al.* explained the selective depletion of T lymphocytes due to depletion of suppressor T cells, while others gave the reason that alloimmunization due to repeated transfusions leads to decrease of T helper cell (T_4). However, others(12-14) reported no difference in the percentage of T cells in thalassemic cases compared to controls.

In splenectomized cases there was further reduction in the percentage of T cells which was significant as compared to non-splenectomized cases ($p<0.002$) and the control group ($p<0.001$). This finding was in accordance with other studies(4-9). However, one study had reported an increase in the absolute number of T cells after splenectomy(13). The reduction in T lymphocytes may play a role in the increased susceptibility to infections. The decreased percentage of T cells was due to a reduction in the number of T_4 (T helper) cells, no change in mean percentage of T (T suppressor) cells being observed(4).

The mean percentage of B cells was significantly raised in the study group in all the age groups compared to the controls. Similar observations have also been reported by others(14).

In the present study there was an even greater increase in percentage of B cells in splenectomized than non-splenectomized-patients(4,13,14), probably because spleen is the major site of B cell sequestration. The number of splenectomized cases in this study is too small, and a larger study is required for corroborating the results.

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NOTES AND NEWS

ASIAN PEDIATRIC NEPHROLOGY CONGRESS

The IV Asian Pediatric Nephrology Congress was held at Taipei, Taiwan on April 9-11, 1993. Prof. C.H. Chen was the Congress President and Dr. C.Y. Lin, the Secretary-General. There were just over 200 delegates from 14 countries. From India Geeta Bajaj, Pradeep Mally, Kumud Mehta, B. Sanjeev Rai and R.N. Srivastava participated. From USA R.W. Chesney, I. Ichikawa, J.C.M. Chan and B. Stapleton gave state-of-the art lectures. Various pediatric renal disorders, especially those more frequently seen in Asian countries were discussed in depth. IgA nephropathy and hepatitis B associated nephritis are the subjects of intensive investigative efforts, and some of the recent work was presented by workers from Taiwan and Japan. Dr. Alfiler from Phillipines presented an overview of leptospirosis associated renal disease, which is not uncommon in that country. Dr. L. Indon presented the experience with renal transplantation in children in Malaysia. There were excellent symposia on Continuous Ampulatory Peritoneal Dialysis and on the use of erythropoitin in end stage renal disease. The delegates from India spoke on various aspects of nephrotic syndrome, hematuria and urodynamic studies.

The Congress was excellent and the hospitality quite overwhelming. A visit to the National Palace Museum was the experience of a lifetime. This museum exhibits fabulous Chinese art treasures going back to 7000 years. The V Asian Pediatric Nephrology Congress will be held at New Delhi in December 1994, with Prof. R.N. Srivastava as the Congress President.