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Relationship between Thalassemia and Depression

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Abstract: Mazandaran province, in the North of Iran, has a high prevalence of thalassemia and depression is a known complication in thalassemic patients like in many other patients with chronic diseases. Much of evidence associating thalassemia and depression has come from descriptive studies and is often inconsistent in its conclusion. This study reports the findings of an Iranian study concerning the relationship between thalassemia and depression. The population of the study was a cohort of 165 thalassemic patients (86 girls and 79 boys), who came to Booali Sina Hospital in Sari, all aging 9-16 years and 201 matched controls. Children Depression Scale was used to investigate depression among them. Rate of depression in thalassemic patients was significantly higher than the control group (14 vs. 5.5%), although the mean depression score was higher in girls of control group than in girls who suffered from thalassemia. Presented data suggest that all patients with thalassemia major and intermedia should undergo depression assessment so that suitable interventions can be implemented.

Key words: Depression, thalassemia, relationship, patients, medicine, Iran

INTRODUCTION

With new advances in medicine and treatment of children who previously died of several diseases and with changes in morbidity and mortality patterns, doctors are facing more psycho-social matters and patients and their families are confronting several social, emotional and behavioral problems (Jarman and Oberklaid, 1990; Gortmarker *et al*., 1990; Pradhan *et al*., 2003). Behavioral disorders in these children are 1.6 times of their healthy counterparts (Jarman and Oberklaid, 1990).

Although no specific feature has been reported in many studies (Jarman and Oberklaid, 1990) some investigations have shown that these children have more social adjustment problems (Cadman *et al*., 1987). Beliefs in the control of their health by chance and by powerful others (Perrin and Shapiro, 1985) negative self-concept (Pahlavani *et al*., 2002) and situation in which the person is unable to terminate undesirable contingencies (learned helplessness) (Akiskal, 2005) are known risk factors for depression.

Moreover, restrictions in social activities, fear, pain and worries about diagnostic procedures, which always induce stress, are other predisposing factors for depression in these children (Bennett, 1994).

On the other hand, some researchers believe that most of the children who suffer from chronic diseases have a good coping ability, even better than their healthy counterpartsand they would begin a normal life.

Thalassemia is the most common genetic disorder on a worldwide basis (Jarman and Oberklaid, 1990). The selective pressures that have made thalassemia so common are not known but are assumed to relate to the geographic distribution of malaria (Keith and Elliott, 2004).

It is one of the most prevalent diseases in Mazandaran province in the North of Iran (0.62 in 1000), particularly in its capital, Sari, with a prevalence of 1.2 in 1000 population (Asghari *et al*., 1997). The gene frequency of ß-thalassemia is as high as 10% in this province (Najmabadi *et al*., 2001).

The impact of thalassemia major and thalassemia intermedia and their associated complications of quality of life are largely known (Pakbaz *et al*., 2005).

Those who are affected by will face many stresses in their whole life, including frequent blood samplings for laboratory tests, multiple transfusions and frequent subcutaneous injections of iron chelator drugs, which altogether will make the patient susceptible to mood disorders such as depression (Perrin and Shapiro, 1985; Asadollahi, 1995; Gholizadeh, 2002).

Some studies demonstrate that 80% of thalassemia major patients at least suffer from one psychiatry disorder (Aydin *et al*., 1997). In contrast, some other studies revealed that thalassemic patients will cope with life

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difficulties in a better way (Palma *et al*., 1998). Previous studies revealed differences in different countries and even in different regions of a country (Tesiantis *et al*., 1996).

Majority of these studies were descriptive ones which are often are inconsistent in their conclusions and have some limitations such as inability to link exposure with a disease in particular individuals, the lack of ability to control for the effects of potential confounding and inability to test for the presence of a valid statistical association. So we decided to design that, the temporal consequence between thalassemia and depression can be more clearly established.

The objective of this study was to evaluate depression in thalassemia major and intermedia patients compared with that in the matched non-thalassemic healthy controls.

MATERIALS AND METHODS

The present study was performed as an analytical, retrospective cohort study. Our cases were 9-16 years old thalassemia major and thalassemia intermedia patients (all definitely diagnosed by using blood electrophoresis), who came to Thalassemia Clinic of Booali Sina Hospital (the only thalassemia center in Sari-the capital of Mazandaran province, which also covers patients from nearby cities). There were 165 patients, including 86 (52%) girls and 79 (48%) boys and informed consent was obtained from each of them and/or their parents. Our controls were 201 students from primary and high schools (schools were selected randomly), including 91 (45%) female and 110 (55%) male students. These controls and their first degree relatives did not have chronic diseases (including thalassemia), according to their past medical history and clinical examinations. This control group matched with the patient group, regarding age, sex and socio-economic level.

We used Children Depression Scale (CDS) (Tisher and Lang, 1983) in our study. CDS has been translated into several languages such as Farsi (Najarian, 1994) and was used in previous studies to investigate depression in children and adolescents (Kazdin *et al*., 1985; Kovacs, 1981; Najarian, 1992). This scale was standardized for Iranian children by Golzari *et al*. (1990). Cronbach's alpha for internal consistency was 0.96 and the 6 week test-retest reliability coefficient was 0.82. Also its construct validity and concurrent validity has been reported satisfactory (Golzari *et al*., 1990). The data was analyzed using descriptive statistics and t test to calculate absolute and relative frequencies, standard deviation and statistical inference.

The CDS has 66 items (48 negative and 18 positive items). The items are rated, using a 5 point Likert-type scale. The scale includes 6 subscales: Affective response (8 items), social problems (8 items), lacking self esteem (8 items), preoccupation with sickness/death (7 items), guilt feeling (8 items) pleasure (8 items) and miscellaneous depression (9 items), miscellaneous pleasure (10 items); 9 negative and 10 positive subscales. The child rates his or her own behavior or feelings by selecting one of five statements that best describes mood. Each of these 66 questions was written on a card. Also we provided 5 boxes which were labeled by one of: Absolutely wrong, wrong, do not know, right and absolutely right (scoring 1 to 5). Then we asked our cases to read the cards carefully and put the cards in the box which they think is the most suitable one. About those children who had some difficulties in reading the cards, the interviewer would read the question for them and would receive answers.

To calculate the Total Score on Depression (TOTDEP), the scores for Pleasure and Miscellaneous Pleasure (Total Score on Pleasure or TOTPE) were subtracted from total CDS score.

RESULTS

In our study, the rate of depression among thalassemic patients was 14% in comparison with 5.5% in the control group, ($p<0.001$). Also average depression score in thalassemic boys was 134±8.18 that was higher than this score among boys of control group (127±7), ($t=6.57$ and $p<0.001$), whereas the average depression score in girls of control group was higher than the same score in thalassemic girls (139±13.68 vs. 135±11.81), ($t = 2.14$ and $p<0.05$). The mean depression score in different age groups is mentioned in Table 1.

Table 1: Average depression score in thalassemic patients and controls in different age groups

	Patients		Controls			
Age group	f*	x†±SD‡	f	x±S.D	t §	p-value
9 years	15	119.18±11.75	22	121.51±5.44	0.6	N.S.¶
10 years	21	129.44±5.65	26	121.76±4.99	4.9	p<0.001
11 years	28	136.05±6.78	33	131.39±9.05	2.3	p<0.001
12 years	24	126.80±4.50	26	132.42±4.99	4.2	p<0.001
13 years	22	134.62±(5.03)	25	140.50±9.10	2.8	p<0.01
14 years	18	144.18±7.94	22	133.44±9.10	4.0	p<0.01
15 years	14	138.64±7.23	21	138.27±15.85	0.1	N.S.
16 years	23	144.10±5.74	26	138.14±16.63	2.3	p<0.005
Total	165	140.39±10.92	201	132.15±12.19	6.8	p<0.001

*: Frequency, †: Mean, ‡: Standard deviation, §: T test, ¶ : Non significant

DISCUSSION

The rate of depression among thalassemic patients in our study is in line with other studies performed in other parts of Iran (Pahlavani *et al*., 2002; Asadollahi, 1995; Gholizadeh, 2002).

In some chronic diseases like, crohn disease, ulcerative colitis, cyctic fibrosis, congenital heart diseases, asthma, epilepsy, diabetes mellitus and cancer, depression has been reported (Kashani and Hakami, 1982; Worchel *et al*., 1998; Youssef, 1988; Austin, 1989; Greenberg *et al*., 1989; Kovacs *et al*., 1990) and the rate of depression is somewhat different from our present results. Some of these differences maybe the result of differences in measurement scales, type, objectivity and severity of the chronic disorder, social environment, ethnicity, social support system, quality of managements and cultural pattern of coping with disease (Tesiantis *et al*., 1996; Behrman *et al*., 1996).

As mentioned previously, some investigators believe that chronically ill children have good coping mechanisms, even better than healthy children. In thalassemic patients in Zahedan, a negative correlation between depression and self-concept was reported (Pahlavani *et al*., 2002) and in assessment of thalassemic adolescents in Shiraz, self-image was like healthy controls (Hashemi and Pooryazdanparast, 2002) and there was no difference of self-esteem between these children and controls (Zare *et al*., 2002). Also in another study on thalassemic adolescents in Tehran, it was shown that, they had dramatically overcome stress and disease conditions (Khodaee and Karbakhsh, 2002).

The main problem for thalassemic adolescents and young adults was that, they had spent their life coming to terms with death (or with their uncertainity about death), but now they are faced with new task of coming to terms with life (and its uncertainties) and this is not easy. As mentioned by Kubler-Ross, in coming to terms with death, patients have an undercurrent of depression (Kulber, 1969; Zisook and Zisook, 2005) which combined with failure of puberty, led to passive behavior.

The introduction of hope, replacement therapyand other progressions in thalassemia treatment produce a more aggressive approach to the problems of their lives and combination of their continuing need to live every day to full and to work towards creating a life for them sometimes leads to excessively lively or assertive behavior.

Some researchers believe that hostility is an important component of the psychological of thalassemic patients (Politis, 1998) and some other investigators have reported significantly lower levels of depression and dramatically higher proportion of repressive style of adaptation in chronic illnesses (Canning *et al*., 1992). Also mechanisms of denial and avoidance could be other reasons for lower rate of depression and better coping in some patients (Jarman and Oberklaid, 1990; Canning *et al*., 1992).

On the other hand, generally depression is more unusual in pediatric patients than in adult patients (Zisook and Downs, 2000).

About, correlation between age and depression in chronic diseases, there are different reports, including no correlation (Canning *et al*., 1991), positive correlation (Kvits *et al*., 1991) and negative correlation (Worchel *et al*., 1998). In our experiment, in age groups of 12 and 13, depression was more prevalent in control group, while in age groups of 10, 11, 14 and 16 it was more prevalent among thalassemic patients.

In general population, prevalence of depression in two sexes is equal up to the time of puberty and then it is more prevalent among girls (Kashani *et al*., 1989).

In children, suffering from chronic diseases, some researchers did not find a significant difference in depression prevalence between the two sexes (Youssef, 1988), but it was demonstrated that in Asthma and Epilepsy, depression is more prevalent in girls (Austin, 1989), while in cancer boys will be more affected with depression (Kashani and Hakami, 1982). In our experiment, the mean depressive score was significantly higher in girls of control group than in thalassemic girls. On the contrary, the mean depressive score in thalassemic boys was significantly higher than control boys. Maybe delay in puberty of thalassemic patients (Mentzer, 1991) differences in stress-inducing factors in boys and girlsand more restrictions for girls in our society are the causes.

CONCLUSION

In brief, the present study reveals that, the rate of depression in thalassemic patients of our society is remarkable and suggests that all patients with thalassemia should undergo depression assessment so that interventions focused on mood domain can be implemented. Development of depression in thalassemic patients not only will lower their quality of life, but also will weaken their cooperation with remedies. So there should be an emphasis on leisure activities and opportunities in which, patients can act out their fears.

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