

Prevalence of Symptomatic Anxiety in Children & Adolescents Suffering from Beta-Thalassemia: “A Longitudinal Study”

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Abstract

This article presents a longitudinal study of symptomatic anxiety in Beta-Thalassemia patients categorically adolescents (both male and female). This study was conducted at Thalassemia center (Afzaal Memorial Thalassemia Foundation, Karachi). Samples were selected through purposive sampling. The sampling population comprised of 196 registered Thalassemia patients with age range between 4 and 17 years. The overall percentage of anxiety was indicated in Thalassemia patients as 63.26%. Among levels of anxiety, we observed mild symptoms compared to moderate and severe. An overall difference of 5%, was found between young and adolescents. i.e., 65% and 60% respectively, and we found no statistical difference between male and female patients. We found mild symptoms of anxiety in greater number of patients suffering from thalassemia. The severity of psychiatric symptoms found, increased with age. A multidisciplinary approach is required, to tackle the disorder from earlier stages of life. Childhood and adolescence set the stage for future development, therefore a rapid team of psychologist in adjunct with medical practitioner, is required to make the quality of life of the thalassemia patient much better.

Keywords: adolescents; anxiety; patient; psychiatric; thalassemia

1. Introduction

Thalassemia is an inherited blood disorder reported to have a prevalence of 5.3% in Pakistan as a whole (Ahmed, 1998). Being a patient with Thalassemia, necessitates lifelong adherence to a complex and tiring medical protocol involving multiple blood transfusions, chelation therapy, intravenous and oral medication. This regimen has the potential to negatively impact the psychological wellbeing of patients and affect their daily living (or their Quality of Life) (Gehi, Haas, Pipkin & Whooley, 2005; Herzer & Hood, 2010; Kumar & Encionsa, 2010; Lin, et. al., 2004). Unfortunately, Pakistan has the highest number of children suffering from Thalassemia all around the world; who rigorously follow a schedule for their survival (Alwan & Modell, 1997). Therefore we need to understand the importance of psychological health, which in turn influences adherence to medication (Gehi, Haas, Pipkin & Whooley, 2005; Herzer & Hood, 2010; Kumar & Encionsa, 2010; Lin et. al., 2004).

A child with Thalassemia is chronically sick; resulting in chronic stress for him/her as well as the family. Despite an extensive amount of literature over comorbidity of mental and physical disorders in adults (Merikangas, Ames, Cui, et.al., 2007; Kalaydjian & Merikangas, 2008; Harter, Conway & Merikangas, 2003), the area of child psychiatric epidemiology has received attention just recently (Chavira, Garland, Daley & Hough, 2008; Cohen, Pine, Must, Kasen & Brook, 1998). However, many surveys conducted, show neurotic manifestations present in children with Thalassemia major. In a study conducted by Guasco, LaMantia and Cuniolo (1987) in Italy, anxiety was diagnosed in children suffering from Thalassemia. Similar results were found in another study conducted in Singapore by Olsson, et al. (2003), where an increase in anxiety levels in children with Thalassemia was observed.

Anxiety is a bodily response towards any threat. Any chronic illness is life threatening and patients with Thalassemia are often anxious. In a study by Ashbury, et.al. (1998) on chronically sick patients, 77% patients out of 913 reported anxiety symptoms during treatment.

Anxiety in children with Thalassemia is evident in different forms. It often takes the form of free-floating anxiety, which is a general apprehension not tied to a specific threat. Every so often, children with Thalassemia face multiple physical problems which result in constant stress and worry. Studies suggest that anxiety in these children is an outcome of early stress exposure originating from the disease itself (Moorjani, 2006). A study by Moorjani and Isaac (2006) showed a higher incidence of free floating anxiety, phobic anxiety and somatic anxiety in adolescents with Thalassemia (same as comment in MFA 1) as compared to controls.

Children exhibit anxiety while facing treatment procedures, sometimes it is due to the hospital environment and sometimes due to the fear of painful procedures. It has been observed in a study that approximately half of the children hospitalized, show needle anxiety and label the pain of pricking as horrifying (Hasanpour, Tootoonchi, Aein & Yadegafar, 2006).

Apart from multiple transfusions and blood sampling procedures, it was found that frequent injections for iron chelation, alleviate the level of stress in a child, making him/her prone to psychological burden usually resulting in anxiety and depression. (Saravi, et. al., 2007).

Children don't comprehend the need for hospitalization and treatment as maturely as adults. Therefore, the admission to hospital induce trauma, and act as a destabilizing factor for them (Commodari, 2010; Shields. 2001; Fung, Low, Ha & Lee, 2008; Rao, Pradham, & Shah, 2008). During medical procedures and treatment of thalassemia, children have to undergo hospitalization causing separation from parents which may result in separation anxiety. Another factor is the overprotection and pampering done by families,

resulting in a child losing his/her independence, further leading them to consider themselves unable to survive without their family. This is corroborated in researches, where a higher separation anxiety rate is observed in children with Thalassemia as compared to controls; separation anxiety in individuals with Thalassemia, 21% ; Separation anxiety in controls, 5.4% (Kaplan et. al 1994).

Children with Thalassemia, whilst going through puberty, experience proliferated medical complications; their transfusions become more frequent, chelation becomes rigorous, and their body physiology goes through change as well.

As observed by Vogiatzi, et al., (2006), individuals with Thalassemia also experience a change in their physical attributes such as facial deformities, stunted growth, bone problems, and arrested puberty; due to which they experience limitations such as difficulty to indulge in typical physical activities and having low levels of energy. These children inevitably acknowledge differences between other children and themselves which is a cause of great stress and anxiety. (Canatan, 2003; Shaligram, 2007; Khodaie, 2005; Mazzone, 2009; Vardaki, 2004; Monastero, 2000).

Hayward et.al. (2004) reported the reason behind children with thalassemia having social phobia and anxiety, to be their confinement at home. This solitary life style is adopted, often to conceal their physical limitations and/or appearance, which is usually perceived as a source of embarrassment and shame for them.

Since adolescence itself has its own set of emotional problems, having Thalassemia causes anxiety, which, if not handled properly, can result in anxiety disorders and/or phobias (Obaid, 2014).

It is not possible for a child with Thalassemia (same as comment in MFA 1) to remain symptom-free, which makes him/her prone to anxiety disorders, however some studies suggest gender disparity when it comes to being psychologically vulnerable. In a study by Naderi, Hormozi, Ashrafi & Emdadi, (2010), prevalence of anxiety disorders was high in females with Thalassemia (same as comment in MFA 1) as compared to males. This suggests a greater need of psychological help for female children with Thalassemia.

Our literature review sheds light on a great deal of psychological suffering experienced by children with Thalassemia (same comment as in MFA 1), which, if left untreated can not only cut short their life span but also deteriorate the quality of their remaining life. This research focuses on the prevalence of such anxiety trends in individuals with Thalassemia (same comment as in MFA 1) and also investigates the difference in level of anxiety between two variables (i.e. Age & Gender).

Methodology

Sample: The longitudinal study was conducted at a Thalassemia Centre (Afzal Memorial Thalassemia Foundation). Sample was selected through purposive sampling. The sampling population comprised of 196 registered Thalassemia children with age range between 4-16 years.

Inclusion Criteria:

- Patients diagnosed with Thalassemia major within the age range of 4-17 years from both genders.
- Patients who have been coming for treatment at AMTF hospital for a year.
- Patients who were ready to participate in research.

Exclusion Criteria:

- Patient who have any other physical or psychological problem were excluded.
- Children below 4 years were excluded from the data.
- Children with co morbid IQ problems were excluded. (it would be better to replace “IQ problems” with (in the best case scenario, an actual IQ cut-off score, or at least more operationally defined concept of “IQ problems.”

Hypothesis:

On the basis of literature review and gap in knowledge, following hypotheses were generated:

1. There will be a high prevalence of anxiety in children with Thalassemia.
2. There will be a high level of anxiety in adolescents with Thalassemia as compared to preadolescents with Thalassemia.
3. There will be a gender difference in levels of anxiety between adolescents and preadolescents with Thalassemia.

Procedure:

Prior to data collection, parents of the children with children were approached and their (informed hopefully) consent was taken; parents who were not willing to participate in the study were excluded. The children were divided into two groups, Group A (with young children aged 4-9 years) and Group B (with adolescents aged 10-16 years). After getting consent, the demographic form was administered along with an extensive interview with each parent. During the clinical interview, a semi structured screening tool was administered to tap emotional and behavioral problems.

Measures:**Demographic Questionnaire:**

Demographic form included information regarding participant's age, race, education level, socio-economic status, and parental education level, total income of the family, family structure, birth order, and family history of having any psychological/physical problems. Total duration required to complete the form was 15 min.

Self- Constructed Screening Tool:

It is consisted of 29 items tapping anxiety, depression and oppositional trends in children. The questionnaire was in Urdu language based on DSM-IV criteria of anxiety, depression and oppositional disorders. The items were formulated based on diagnostic classification and were later translated in most commonly spoken language, Urdu. Two separate Urdu versions were formulated from different translated versions and after a panel discussion, only the questions high on validity were selected. The questions aping anxiety were selected for our study.

Statistical analysis:

Descriptive statistics including mean, standard deviations and frequency data were used for getting a statistical view of characteristics of the sample in a summarized way. After descriptive statistics, chi-square was applied to observe frequency distribution of anxiety levels between the 2 groups and t-test was utilized see the difference in level of anxiety among both genders. Data was analyzed using IBM SPSS v19 (Armonk, NY) software.

Results

Our sample population comprised of (N=196) Thalassemia patients; population was divided into two different age groups, with group “A” having (N=120, % = 60.9, Mean age =6.2) and group “B” having (N=75, %=38.1, Mean age =12.2). The overall mean age was 8.42 years. A total of 106 patients with thalassemia belonged to a joint family structure (% = 53.5) while the remaining 89 belonged to a nuclear family system (% = 45.2). An almost balanced participation of gender was maintained with 100 female participants (% = 51.02) and 95 male participants (% = 48.46) (Table: 1)

Result table 2, through chi square values indicate a high percentage of anxiety present in Thalassemia population i.e. 63.26%. Only 36.73% population appears to be symptom free. Among the three levels of anxiety, mild symptoms were comparatively redundant in the sample population (n=50, 25.51%) as compared to moderate (n=32, 16.32%) and severe level (n=42, 21.42%).

Table 3 presents a comparative analysis between “Young children” with Thalassemia and “Adolescents” with Thalassemia. Chi-square values are used to identify percentage difference in 3 levels of anxiety. An overall difference of 5% was reported with Young children with Thalassemia obtaining a total score of 65% while adolescents with Thalassemia scored 60% on anxiety scale. Despite a comparative low aggregate score of adolescents with thalassemia, their anxiety ranges were high on mild and severe anxiety levels (Mild = 26.31%, Severe= 22.36%) as compared to pre-adolescents (Mild = 25%, Severe = 20.83%), while an inverse relationship was true for Moderate anxiety levels (Adolescents = 11.84%, Young children = 19.16%). Graph 1 provides a pictorial representation of anxiety level ranges of pre-adolescents and adolescents with thalassemia as depicted in table 3.

Difference in the level of anxiety among girls and boys with thalassemia is shown in table 4 through independent sample t-test. Results indicate no statistically significant difference at alpha level 0.05. ($p = 0.45 > 0.05$, $df = 191.7$). However, mean values indicate a slight discrepancy between males and females, where males scored (Mean=16.36) as compared to female (Mean = 15.99).

Tabulated Data:**Table 1 showing Demographic characteristics of the sample population:**

Demographic Characteristics Of children with Thalassemia		Total No. N	Frequency %	Mean
AGE RANGES				
(I)	Young children (4-10)	120	60.9	6.2
(II)	Adolescents (11-16)	75	38.1	12.22
				Overall 8.42
FAMILY STRUCTURE				
(i)	Joint	106	53.5	
(ii)	Nuclear	89	45.2	
Gender				
(i)	Male	95	48.46	
(ii)	Female	100	51.02	

Table 2 showing Chi-square percentages for level of anxiety among children with thalassemia

LEVEL OF ANXIETY	FREQUENCY N =196	PERCENTAGE %
NO	72	36.73 %
MILD	50	25.51 %
MODERATE	32	16.32 %
SEVERE	42	21.42 %
OVERLL ANXIETY SCORE	124	63.26%

Table 3 showing Chi-square percentages for level of anxiety among adolescents with Thalassemia and young children with Thalassemia

Anx ranges	School age (N=120) N	percentages	Adolescents N=75 n	percentages
No Anx	42	35 %	30	39.47 %
Mild Anx	30	25 %	20	26.31 %
Mod Anx	23	19.16 %	9	11.84 %
Severe Anx	25	20.83 %	17	22.36 %
		*65%		**60%

*Overall Anxiety in adolescents = 60%

**Overall Anxiety in preadolescents = 65%

Graph 1 showing incidence of anxiety along with ranges in young children and adolescents.

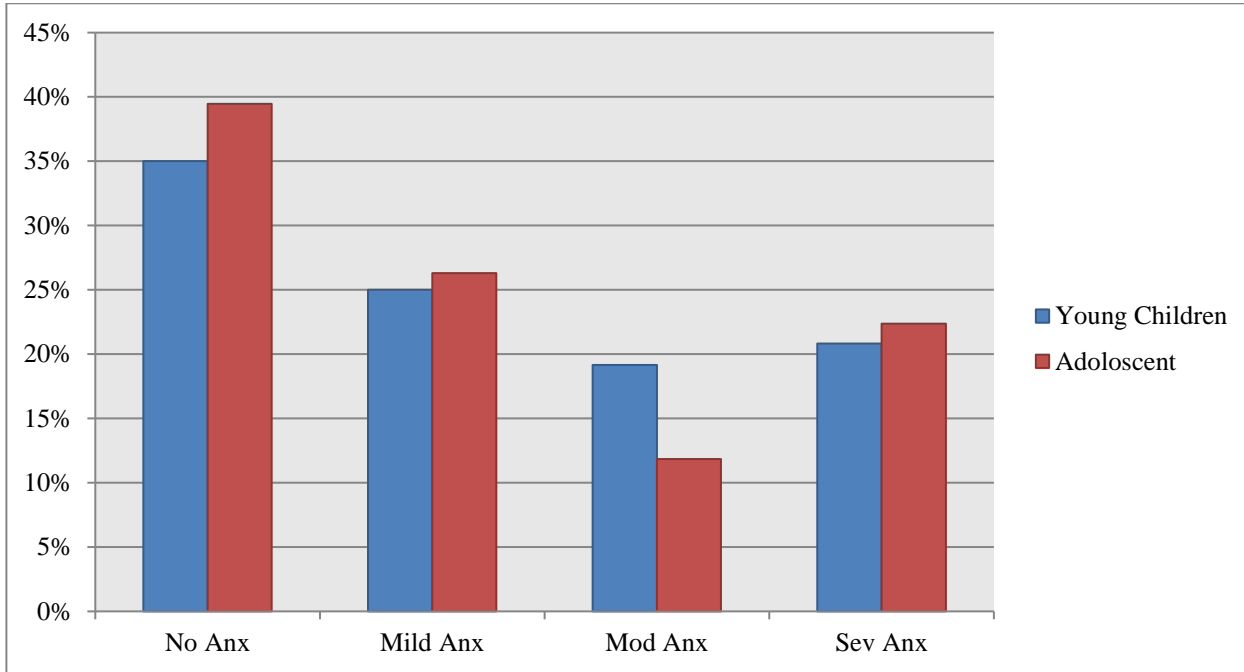


Table 4 showing difference in levels of anxiety among girls with Thalassemia and boys with Thalassemia through Independent sample t-test

	Gender	N	Mean	Std. Deviation	Std. Error	t
ANXIETY	Male	95	16.36	3.494	.359	.74
	Female	100	15.99	3.398	.340	

t = .74, df = 191.7, p > .05

Discussion

Adolescence is a time of great psychological changes. Issues experienced in later teens are often developed and rooted in earlier childhood. Fear and phobias stemming from irrational childhood beliefs, if not addressed, often result in significantly impairing mental health concerns which can cause great discomfort. The development of the individual during this period of life can be divided into three main stages: early, middle and late adolescence, each characterized by specific biological, psychological and social steps.

As widely reported, chronic conditions can negatively affect the developmental stages of a child; and similarly, it is seen to have a detrimental effect on the psychosocial development of a child who is chronically ill. The reverse is true for the detrimental effect of psychosocial problems on a child who is chronically ill. {Michaud, 2007, *The Adolescent with a Chronic Condition*}.

Accordingly, our current study aimed to investigate the presence of anxiety in transfusion dependent children with Thalassemia (young and adolescent). It was hypothesized that i) There will be a high prevalence of anxiety in children with Thalassemia ii) the level of anxiety in adolescents with Thalassemia would be high as compared to preadolescents with Thalassemia. iii) There will be a gender difference in the level of anxiety between adolescents with Thalassemia & preadolescents. Results presented a mixed picture.

Demographics in table 1 show a preponderance of young children (60.9%) as compared to adolescents (38.1%) in the affected families who were randomly selected. This can be due to the mortality factor; many patients with thalassemia, due to iron overload and heart complications, fail to reach adolescence. According to Nordqvist, (2014) as reported by American Academy of Family Physicians, patients with beta thalassemia live an average 17 years and usually expire before they are thirteen years old. Hence the dip in patient registrations occur after reaching early teens.

Result table 2 proves our first hypothesis showing high incidence of anxiety symptoms in thalassemia population (63.26%). This high rate, albeit being alarming, is the first step in identifying triggers causing mental discomfort in the Pakistani population with thalassemia. With the dearth of scientific data for Karachi based transfusion dependent children, there is a surplus amount of research data all over the world for psychological functioning in individuals with thalassemia. Studies show that 80% of patients with thalassemia have one psychiatric disorder at the least (Aydin, Yaprak, Akarsu, Okten, & Ulgen, 1997)' moreover, vulnerability of beta-thalassemia population toward specific psychological problems such as anxiety and depression is widely reported (Cakaloz, Inanc, Polat, Inan, & Oguzhanoglu, 2009; Mikelli & Tsiantis, 2004; Messina et al., 2008; Ghanizadeh, Sirin, & Hamid, 2006; Shaligram, Girimaji, & Chaturvedi, 2007; Hashemi, Borounjeni, & Kokab, 2012). Evaluative studies have shown many risk factors and causes behind these psychological disturbances. Longer duration with a severe physical disease attributes to mental problems (Olsson et al., 2003; Kokkonen & Kokkonen, 1993) and stress exposure. Anxiety specifically, has been strongly related with early stress exposure. Having said that, individuals with thalassemia go through a life of physical problems in the form of low BMD, fractures and bone pain, which can be said to result in early stress exposure. Also, majority of patients with thalassemia complain of headaches due to low Hb level and weakness. this can be corroborated by other studies which have shown that chronic pain is co morbid in patients of anxiety disorder. (McWilliams, Cox, & Enns, 2003; Christian, 2003; Thomas, Jones, Scarinci, & Brantley, 2003). Poor self-esteem is universally linked with anxiety disorder, children with thalassemia often suffer from inferiority complex due to their physical appearance; they fail to be confident enough to take charge of their own life, which sometimes gets pathological in the form of somatization. Similar findings were obtained in other researches which also further elaborate this factor and have shown a somatization trait present in patients with thalassemia patients. (Messina G. , et al., 2008)

We presumed that with the growing age factor, there will be an increase in the anxiety level of patients of thalassemia. However, our results indicate the opposite; table 3 clearly shows significant difference

between anxiety levels of preadolescent and adolescent patients but the aggregate score is high for preadolescent individuals (65%). However, detailed analysis reveals that with advancing age, the level of severity increases for anxiety symptoms and the problem ceases to be of moderate nature due to the developmental complexities of adolescence. The adolescent phase requires more adjustment skills and coping abilities; in case of a contingent chronic disorder such as thalassemia, aspect of late sexual maturation & marriage circumstances, decreased satisfaction with life can result in psychiatric abnormalities. (Khaniet al., 2012)

. Another reason behind severity of anxiety levels in adolescents with thalassemia, is their anticipation of death. With a gradual decline in health and approaching age, individuals with thalassemia expect death, causing low compliance towards treatment and thus creating the potential for more complex psychological dysfunctions. (Goldbeck, Baving, & Kohne, 2000)

However, problems and anxieties faced during the preadolescence or early childhood phase are different. One of the determinants of quality of life in this period, is adjustment in school life. School problems such as disease related absenteeism and poor peer group adjustment are commonly found in patients with thalassemia of this age group. (Conatan, Ratip, Kaptan, & Cosan, 2003). A threatening school environment with verbal abuse and lack of peer support for a chronically ill child, can become a source of anxiety. Teachers' lack of awareness with the disease can be seen to further cause hurdles to the integration of a chronically ill child in school. (Baloch, 1986) (Westbom, 1992).

The present study also had the objective of finding gender differences in relation to anxiety levels. It was assumed that due to the female gender's susceptibility to emotional problems and trait anxiety (Wilks, 1998), the level of anxiety would be higher for the female thalassemia population. Result table 4 did not support our hypothesis. Findings indicate that intensity of psychological abnormality in both genders is same; demanding equal access to psychiatric consultancy. Many factors contribute to the result; such as same treatment protocol experienced by both boys and girls. They both receive same form of treatment; be it the chelation therapy, phlebotomy procedures or frequent transfusions. The level of discomfort experienced as well as perceived by both genders remain same. Environmental factors also play an important part, where both the children (girls & boys) are taken care of, by primary caregivers and lack the independence which is gender specific in Pakistani society.

2. Conclusion

Thalassemia continues to be the most daunting hematological disorder without any permanent cure. It demands regular transfusions to survive, along with extensive therapy for resulting byproduct of iron load. Despite these medical treatments, the psychological problems faced by patients of thalassemia, reduce the compliance towards treatment. In a developing country like Pakistan, noncompliance is one of the major reasons behind early death. While the importance of psychological intervention in thalassemia major has been established, its implementation is still a big question. A multidisciplinary approach is required to tackle the disorder from earlier stages of life. Childhood and adolescence set the stage for future development. Therefore, a rapid team of psychologists, in adjunct with medical practitioners is required to increase the quality of life of patients with thalassemia with the goal of making their lives as fulfilling as possible.

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