CORRELATION BETWEEN PSYCHOSOCIAL ISSUES AND NONCOMPLIANCE IN SPINAL ORTHOSIS IN PATIENTS WITH ADOLESCENT IDIOPATHIC SCOLIOSIS

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ABSTRACT

Objective: *The aim of this study was to find a correlation between psychosocial issues and noncompliance in spinal orthosis, in patients with adolescent idiopathic scoliosis.*

Material and Methods: *This study was conducted at Pakistan Institute of Prosthetic and Orthotic Sciences (PIPOS), Peshawar, Pakistan in 2008-09. The brace questionnaire (BrQ) was used to collect the quantitative data. All the questions were answered according to the Likert scale in the following five responses, "Always", "Most of the times", "Some times", "Almost Never" and "Never". Descriptive statistical analyses were done and a correlation coefficient test was applied to get the results.*

Results: *The total numbers of participants were 15 (06 boys and 09 girls) with mean age of 14.13± 1.68 years (range 12 to 17). Average wearing time was recorded as 2 years with a range of 0.25 to 04 years. Average compliance rate was recorded as 16.7 hours per 24 hours with a range of 4 to 24 hours use of orthosis per 24 hours. The average negative psychosocial impact was 51.4% ± 10.5%. A strong correlation of 0.85 was found between noncompliance and the psychosocial issues in clients with spinal orthosis.*

Conclusion: *A positive correlation was found in our study between noncompliance and psychosocial issues. Psychosocial counseling of adolescents with AIS along with orthotic treatment may improve compliance and therefore, the outcome. Large scale study is required to address the psychosocial issues in AIS patients to improve the compliance and the outcome of treatment.*

Key words: *Spinal Orthosis (SO), Adolescent Idiopathic Scoliosis (AIS), Noncompliance, Psychosocial Issues.*

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INTRODUCTION

Adolescent idiopathic scoliosis (AIS) is a three dimensional deformity of the spine, characterized by the lateral curvatures and vertebral rotation due to an unknown cause[1]. It affects 2 to 4% of adolescents and is more common in girls than boys.[1-3] AIS is treated in skeletally immature patients conservatively with spinal orthosis, and has proved its efficacy to decrease or prevent the curve progression,[4,5] with full time compliance (20-23 hrs/day).[6,7] Orthotic management of scoliosis is a disturbing experience for adolescent clients and families[8, 9] with an ongoing problem of compliance.[10]

Noncompliance varies from 20 to 85%[6,11] and is associated with greater degree of curve progression[12]. Karol LA[11] has found that compliance is better during the initial days of treatment but it deteriorates with the passage of time. Historically compliance is measured by patient's self report and is always over estimated.[6,13] This was also confirmed recently by Helfenstein et al[6] and Nicholson et al[1] which showed a substantial difference in self reported compliance in contrast to compliance measured by data logger. Gender and psychosocial issues such as negative body image, depression, emotional disturbances and self esteem lead to noncompliance and subsequently to orthotic treatment failure.[3,9,14]

The purpose of this study was to find the correlation between psychosocial issues and noncompliance in spinal orthosis, in patients with AIS, by conducting a survey based on questionnaire containing different questions on the negative effects of psychosocial issues related to patients and families.

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MATERIAL AND METHODS

Inclusion Criteria

Patients fulfilling the following criteria were included in the study;

- Must be 12 to 17 years of age.
- Diagnosed with adolescent idiopathic scoliosis (AIS)
- Fitted with thoraco-lumbo-sacral orthosis (TLSO or Boston)
- Patients must have at least two months experience with the orthosis wear.

Exclusion Criteria

Patient's undergone surgical procedure

Apparatus and Data Analysis:

A reliable disease and brace wear specific survey questionnaire (Brace Questionnaire, BrQ) was used to collect the data. The questionnaire contained thirty four items being grouped into eight sections. They were (a) General health description (b) physical functioning (c) emotional functioning (d) self esteem (e) validity (f) school activity (g) painful spinal condition and (h) social functioning. All the questions were answered according to the likert scale, in the following five responses, "Always", "Most of the times", "Some times", "Almost Never" and "Never". Scoring scale for these items is 1 to 5 from "always" to "Never".

Quantitative data was recorded according to the age, orthoses wearing time per twenty four hours, body image, self esteem, activities, social life, spinal conditions and treatment option etc. Patients with language problems were assisted by author in completing the questionnaires. The received data was entered to excel spread sheet and was analyzed at 95% confidence interval. Descriptive statistical analysis was done with Microsoft Excel. Means, medians, standard deviation and percentages were executed for different variables. As the correlation between psychosocial issues {independent variable (IV)} and noncompliance {dependent variable (DV)} in spinal orthoses were examined, therefore, a linear correlation coefficient and regression analysis were carried out. The linear correlation coefficient is a quantity between +1 and -1, which shows a direct/strong or inverse/weak correlation between the two variables.

RESULTS

The total number of participants were 15 (boys = 06 and girls = 09) with mean age 14.13 $\pm$ 1.68 years with a range of 12 to 17 years as per inclusion criteria. All patients were skeletally immature. Female clients were below 16 while male clients were below 18 years of age.

The frequency of scoliosis in male and female population was 40% and 60% respectively as shown in figure I below. Average wearing time was recorded as 2 years with a range of 0.25 to 04 years. Average compliance rate was recorded as 16.7 hours per 24 hours with a range of 4 to 24 hours use of orthosis per 24 hours. Table I below shows total number of participants, their age, orthosis wearing time and its use per 24 hours. Gender wise it was found that boys are more compliant than girls.

PARTICIPANTS, THEIR AGE, ORTHOSIS WEARING TIME AND ITS USE PER 24 HOURS

S. No.	Gender		Age in yrs	Wearing time (yrs)	Hrs/ Day
	Boy	Girl			
1	1		17	4	18
2		1	13	0.25	4
3	1		16	4	23
4		1	12	3	24
5		1	14	0.25	5
6		1	13	0.42	17
7	1		13	0.34	9
8		1	12	0.5	20
9		1	13	2	23
10		1	15	1.5	16
11	1		16	0.75	20
12	1		17	4	15
13	1		13	3	21
14		1	14	3.5	13
15		1	14	2	22

Table I

FREQUENCY RATE OF SCOLIOSIS IN MALE AND FEMALE POPULATION

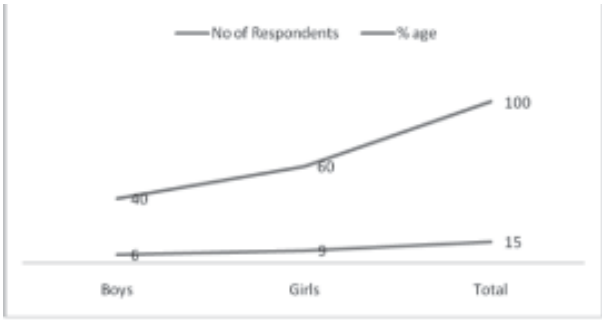

Fig. I

Four different groups of compliance in spinal orthosis were identified, they are <10, 11-15, 16-20 and 21-24

hours of orthosis used per 24 hours. The percentage compliance for these groups was 20%, 13%, 20% and 47% respectively, figure II below shows the four identified groups.

FOUR IDENTIFIED GROUPS WITH %AGE USERS

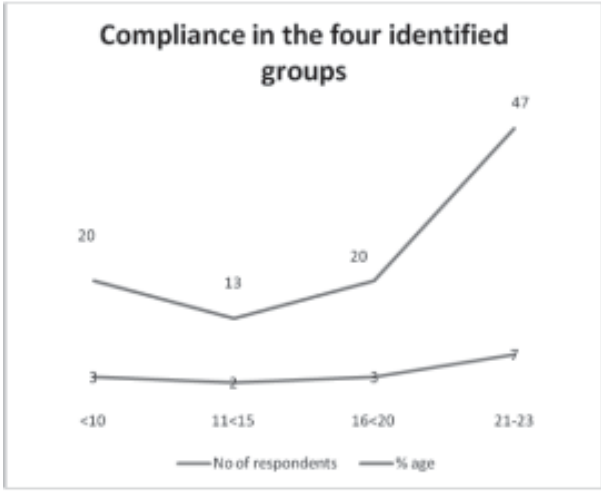

Fig. II

Majority of the patients suffered from psychological and social distresses, with a higher rate in the less compliant group (less than 20 hrs/24 hrs wearers). The average negative psychosocial impact was 51.4% ± 10.5% (range: 20% to 73%).Those who felt nervous, tired and exhausted and worried while using orthosis were 53% each. 73% felt ashamed with the orthosis. 53% of the patients were facing difficulties with their lessons and the same percentage were not happy of their body posture. 46% were not happy of their lives. However 47% did not used special clothing while wearing orthosis. Figure III below shows the most important psychosocial issues with the respondent's number and percentages.

Average degree of psychosocial issues was calculated, Table II, and the correlation coefficient test was done. A positive correlation 0.846 was recorded; figure 4 shows the results of the correlation test and its graphical presentation, which means that there is a strong correlation between psychosocial issues and non-compliance in spinal orthosis use.

DISCUSSION

Adolescent idiopathic scoliosis has got negative effect on physical as well as mental health of the patients. Surgical correction of AIS in appropriate patients can not only offer curve correction but may also increase the self-esteem and life satisfaction of the patient.[15] However surgery may not be offered to every patient and in current practice, brace treatment is frequently used for adolescent idiopathic scoliosis.[16] However the choice of brace treatment by scoliosis patients is mainly determined by effectiveness and discomfort in wearing a brace

AVERAGE DEGREE OF PSYCHOSOCIAL ISSUES

Hours of use	Average degree of psycho-social issues
17	3.125
5	4.411
8	3.647
12	3.558
5	3.911
17	3.47
9	3.735
20	2.818
23	2.971
16	2.647
20	2.882
15	3.2
21	4.4
13	3.7
22	2.9

Table II

PSYCHOSOCIAL ISSUES, FREQUENCY & %AGE OF RESPONDENTS

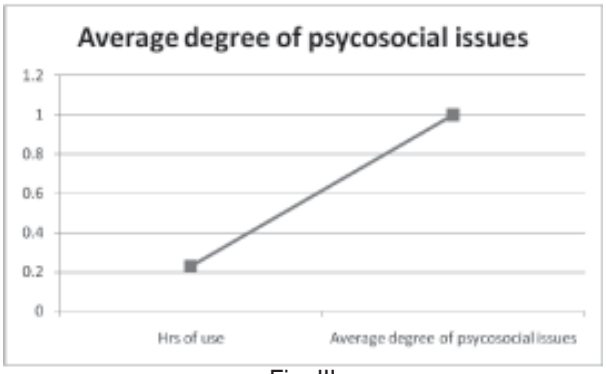

Fig. III

and also by the amount of reduction in risk of surgery by brace treatment.[17]

Studies have shown that bracing is associated with psychological problems related to disturbed perceptions of self and body image of the patient.[18,19] This leads to decreased compliance of brace usage which is a is a major barrier to success in adolescents scoliosis than with younger patients.[20] The average compliance of use (orthosis wearing time 20-23 hrs /24hrs in spinal orthosis)[6,7] in patient with AIS was 45.5% in our study, which is

less than the findings of Nicholson et al[1], while in the range as shown by Helfenstein et al[6] and Karol, (2001)[11]. In our study the boys (50%) were more compliant than girls (43%). However other studies have demonstrated that the compliance rate is higher in female patients as compared to male patients.[12] Overall the prevalence rate of AIS is also higher in females than males with a ration of 2 to 1.[1-3] Our study support this statement and the results achieved were closer to the previously recorded data. It was recorded as 60% and 40% in girls and boys respectively.

The average negative psychosocial impact in patients with AIS was 84%[14]; however this was found as low as 52.4% -+ 10.5% in this study. In contrast to Nicholson et al (2003)[1] the number of patients who don't like the appearance of orthosis and felt different from others were much higher in our findings. 45.5% were worried about their look and the same number felt tired and exhausted in social life. Patients who noticed change in friend's behavior and felt different from their peers were 45%, however the number of these individuals is a bit higher in the previously published studies.[21]

It is found that adolescents with chronic sickness like AIS are shy to express their feelings to the clinicians or psychologist openly[8]. We found that 45.5% of the patients were ashamed about their body posture and during their social gatherings like weddings, parties etc.

Research supports that patients with spinal orthosis suffer from emotional disorders.[8,14] The findings in this study strongly support these arguments as around 40% of the respondents felt difficulty in their sleeping and other activities of daily living like schooling etc. The society in which this study was performed the kids and adolescent normally use to sit on the floor in their schools for around 6 to 7 hrs. This prolong sitting on the floor with the spinal orthosis was recorded extremely difficult task.

Patients with scoliosis are deeply concerned with clothing and self-perception.[19] In contrast, we found that young clients fitted with spinal orthosis were not using special clothing (63.6%), as the normal wearing dress of the people is Shalwar and Qamees (a long shirt), which mostly covers the appearance of the orthosis.

CONCLUSION

A positive correlation was found in our study between noncompliance and psychosocial issues. It has been suggested that psychosocial counseling of adolescents with AIS along with orthotic treatment may improve compliance and therefore, the outcome of the conservative treatment. The psychologist inclusion in the rehabilitation team may be of great help to the patients, parents and also to the health career providers. However, no work or very little work has been done on this aspect to show its success or otherwise. The results from this study may not be generalized due to the small sample size. However, the difference in results of this study to previously published material may be due to the different demographics and culture in which the study was performed.

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CONFLICT OF INTEREST

Authors declare no conflict of interest

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NONE DECLARED