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Research Article

Effects of Sagittal Alignment of Spine on Quality of Life in Young Men

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Abstract: This study is an attempt to assess relationship the Quality of Life (QOL) of young people with spine deformities. There is considerable controversy regarding the differences of Spine deformities on QOL. Furthermore, little work has focused on the relationship of spine deformities and QOL of young people. This is a questionnaire-based study of young people. 99 young people volunteered to participate in this study (Age: 20.93 ± 1.64, Weight: 70.89 ± 12.96, Height: 1.76 ± 0.06, BMI: 22.66± 3.72). To determine the degree of kyphosis and lordosis deformity of the trunk that was flexible ruler. QOL was evaluated by a questionnaire. We evaluated differences between factors using one-way ANOVA and Scheffe post hoc test, significance was for $p < 0.05$. Considering all factors showed a significantly difference about extramarital relations in kyphosis group; post hoc test showed that this difference was between hypo normal and normal groups. About other factors, there was no significantly difference. Between QOL factors that were examined in this study, only the extramarital relations show significant difference in kyphosis group. It seems that sagittal alignment of spine in young people doesn't have considerable effects on QOL.
Keywords: Quality of life, Young men, Kyphosis, Lordosis

INTRODUCTION

The normal spine is strong and mobile. While it varies in size and shape from person to person, the healthy spine has natural front-to-back curves that enable us to walk, balance, sit, stand and twist—all of which are complex interactive movements. When these natural front-to-back curves become too large, they can present a potential problem [1]. Kyphosis is an abnormal increase in normal posterior curvature of the thoracic spine which can result in a noticeable round back deformity. Kyphosis was reported to be associated with ventilator dysfunction [2], diminished daily physical function [3], impaired quality of life [4], and increased mortality [5-7].

Lordosis is a state of exaggerated of curvature of the lumbar spine with excessive anterior pelvic tilt. In this condition body weight is transferred from the strong broad, supportive portion of the vertebral bodies to the more delicate arches, and at the same time, the spinous processes move closer than usual to one another. This narrows the vertebral foramina through which the nerves pass, a process which over time may generate pressure on nerve roots in the lumbar area [8].

Advances in medical care have changed the emphasis in paediatric medicine from the diagnosis and management of infectious disease to prevention and control of chronic conditions. Mortality is no longer viewed as the only endpoint when considering the efficacy of medical intervention. Issues of quality of life (QOL) are also important. As a consequence, there has been a call for new outcome measures that reflect a more holistic approach to management.

Such an emphasis reflects contemporary views about the relation between mind and body, and acknowledges the critical link between physical and psychological health. QOL measures may be of potential value in comparing outcomes in clinical trials, evaluating interventions, commissioning programmes of care, assessing the outcomes of new treatments, and in audit work. As in adult work, issues about the definition and measurement of QOL have been a matter of considerable debate [9, 10]. Several key ideas define the concept of QOL. First is the idea that individuals have their own unique perspective on QOL, which depends on present lifestyle, past experience, hopes for the future, dreams, and ambition. Second, when used in a medical context, QOL is generally conceptualized as a multidimensional construct encompassing several

domains [11]. This follows from the widely accepted definition of health put forward by the World Health Organization as the state of complete physical, mental, and social wellbeing and not merely the absence of disease or infirmity [12]. The Group goes on to describe QOL as "the individual's perception of their position in life, in the context of culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns" [13].

Third, QOL can include both objective and subjective perspectives in each domain [14]. The objective assessment of QOL focuses on what the individual can do, and is important in defining the degree of health. The subjective assessment of QOL includes the meaning to the individual; essentially it involves the translation or appraisal of the more objective measurement of health status into the experience of QOL. Differences in appraisal account for the fact that individuals with the same objective health status can report very different subjective QOL: "The patient's perceptions of, and attributions about the dysfunction are as important as their existence" [13, 15]. Previous studies reported the correlation of some malalignments with QOL. For example Abhishek *et al*. [16] in a cross-sectional study answer to this question that "Are hallux valgus and big toe pain associated with impaired quality of life?". They show that concurrent HV and big toe pain but not isolated HV associates with impaired overall satisfaction with health and low score on the physical, psychological and social domains of World Health Organization Quality of Life -BREF (WHOQ OL-BREF) (2). de Oliveira Ferreira *et al*. [17] evaluate quality of life (QOL) in women with postmenopausal osteoporosis, correlating the QUALEFFO 41 with the short-form health survey 36 (SF-36) and evaluate d some factors that can influenced the QOL of women with osteoporosis. They reported that women with osteoporosis had an impaired QOL, especially relating to the physical, psycho-logical and social aspects. The factors associated with QOL were obesity, sedentary lifestyle and paidwork [17]. Given that previous studies of quality of life for people with spinal deformities, particularly in young people, little attention has been, thus, in the present study we examined the differences between quality of life and abnormalities of the spine deal (kyphosis & lordosis).

MATERIALS AND METHODS

99 young people volunteered to participate in this study (Age: 20.93 ± 1.64, Weight: 70.89 ± 12.96, Height: 1.76 ± 0.06, BMI: 22.66± 3.72). Characteristics of subjects in kyphosis and lordosis groups are given in table 1.

Table-1: Characteristics of subjects based on kyphosis and lordosis groups (Mean ± SD)

	Kyphosis			Lordosis		
	Hypo	**Normal**	**Hyper**	**Hypo**	**Normal**	**Hyper**
Age (years)	21.21 ± 1.61	20.90 ± 1.68	20.29 ± 1.25	21.00± 1.87	21.06 ± 1.73	20.48 ± 1.16
Weight (Kg)	72.47 ± 10.67	71.20 ± 13.67	62.44 ± 11.14	78.77 ± 12.46	70.4 ± 13.57	69.11 ± 10.13
Height (m)	1.77± 0.07	1.76 ± 0.06	1.75 ± 0.09	1.80 ± 0.04	1.76 ± 0.06	1.77 ± 0.06
BMI (Kg/m^2)	22.94 ± 3.03	22.82 ± 3.98	20.07 ± 2.41	24.05 ± 3.08	22.68 ±4.00	21.97 ± 2.89

To determine the degree of kyphosis and lordosis deformity of the trunk that was flexible ruler 60 and 40 cm were used. The validity and reliability of this measurement reported in previous studies [18, 19]. Also, in this study, we use a stabilizer to reduce postural sway [20]. This method was used for the measurement [18-20].

To adequately expose the low back, all subjects wore shorts (men). Each subject stood barefoot on the base of a platform and assumed a comfortable, erect posture with the body weight evenly distributed between both feet [20]. A flexi curve was pressed against the subjects' back so that the upper end of the flexi curve was set at the C7 spinous process and the lower end was placed at the S2 level. We instructed the subjects to stand relaxed and naturally during the measurement. The outline of the flexi curve was then placed on a piece of paper and the curve traced by running a pen along the flexi curve [7].

Measurement of lumbar lordosis; the subject remained in the normal standing posture while lordosis was measured. The flexible curve was pressed against the spinous processes of the lumbosacral spine, and the points that intersected the adhesive markers were recorded. The flexible curve then was lifted from the spine without changing the configuration of the curve. The convex side was traced on paper (Fig. 1). The points that intersected L3 and S2 were marked, and a line was drawn between them. The length of this line (labeled L) was measured using a micrometer caliper. Another line (labeled H), representing the height of the curve, then was drawn [21].

QOL was evaluated by a questionnaire; main Questionnaire was the quality of life questionnaire with 192 questions, which measured 15 quality of life scale [24]. But In this study, we were used from the QOL questionnaire, with 72 questions that measured the 6 domains of QOL include: 1. Physical well-being (P_a), 2. Job satisfiers (P_b), 3. Creative / aesthetic behavior (P_c), 4. Extramarital relations (P_d), 5. Personal growth (P_e), 6. Altruistic Behavior (P_f). For each factor, we had 12 questions. Each question consists of a statement, which is answered either true or false. Inter-correlations with

two independent inventories of physical health and general well-being were all statistically significant [22]. The QLQ is validated for patients aged 18 and above [22, 23]. We evaluated differences between factors using one-way ANOVA and Scheffe post hoc test, significance was for $p < 0.05$.

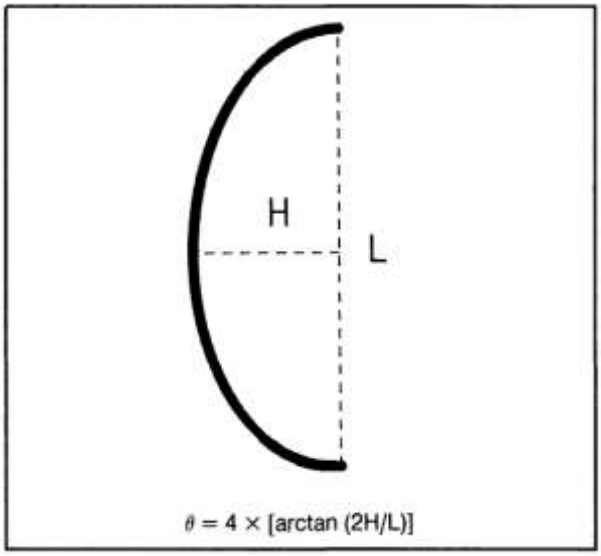

Fig. 1: Curve representing the tracing obtained through the use of the flexible ruler. The index of lordosis (0) is obtained by the formula shown where L = the length of the curve and H = the height of the curve (23)

RESULTS

Table 2 reports QOL factors for kyphosis and lordosis groups, comparing hypo normal, normal and hyper normal groups. Considering all factors showed a significantly difference about extramarital relations (Pd) in kyphosis group; post hoc test showed that this difference was between hypo normal and normal groups (Fig 2). About other factors, there was no significantly difference (Fig. 3).

Table 2: Differences of QOL factors between kyphosis and lordosis groups (ANOVA)

	Kyphosis			Lordosis		
	F	**df**	**p**	**f**	**Df**	**p**
P_a	1.46	108	0.23	2.37	108	0.09
P_b	0.34	108	0.7	0.09	108	0.35
P_c	0.4	108	0.67	0.31	108	0.73
P_d	3.8	108	0.02	0.13	108	0.87
P_e	1.77	108	0.17	2.37	108	0.09
P_f	2.07	108	0.13	0.35	108	0.69

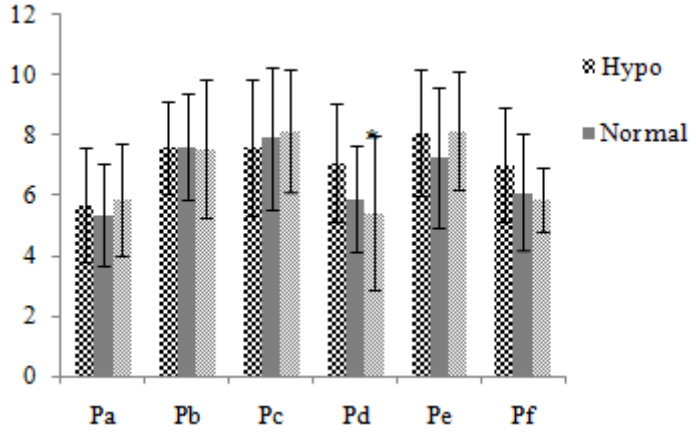

Fig. 2: QOL between Kyphosis groups

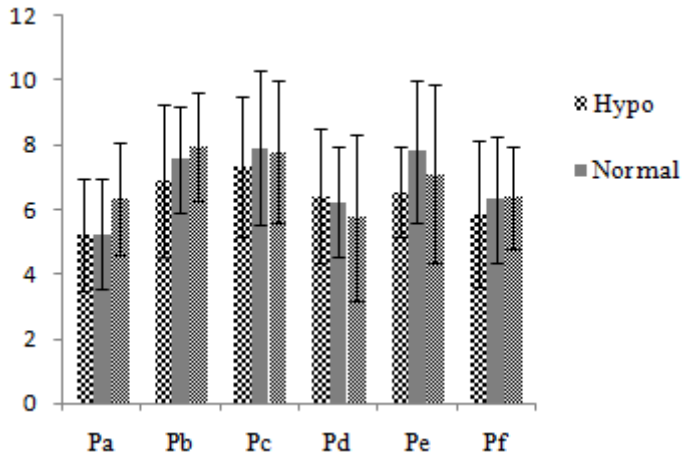

Fig-3: QOL between Lordosis groups

DISCUSSION

The present study was designed to show differences of QOL factors between kyphosis and lordosis groups. Many studies have examined the impact of disease and abnormalities on some domains of quality of life [16, 17, 22]. On the other hand, some studies have examined the effects of brace on quality of life [24, 25]. However, few studies have examined the quality of life for people with spinal deformities [4], especially for young people.

One unanticipated finding was that all QOL factors other than just one of them, between kyphosis and lordosis groups did not show significant differences. Extramarital relations in kyphosis group show significant difference. This finding is not in agreement with Miyakoshi [4] findings which showed QOL in patients with osteoporosis was impaired by postural deformities, especially by whole kyphosis, and that spinal mobility has a strong effect on QOL in these patients. A possible explanation for this might be that the subjects of their study were postmenopausal women aged over 60 years with osteoporosis but in this study our subjects are young people [4]. In another study Abhishek *et al*. [16] examined the association between self-reported hallux valgus, big toe pain and impaired quality of life in primary care populations. They study on men and women aged over 30 years and they shows that concurrent HV and big toe pain but not isolated HV associates with impaired overall satisfaction with health and low score on the physical, psychological and social domains of World Health Organization Quality of Life [16]. Martin *et al*. [22] studied the impact of osteoporosis on quality of life. The subjects of this study were women with an average age of 31 to 89 years. They reported that osteoporosis has significant impact on QOL of these women [22]. Ferreira *et al*. [17] evaluate quality of life (QOL) in women with postmenopausal osteoporosis, correlating the QUALEFFO 41 with the short-form health survey 36 (SF-36) and evaluated some factors that can influenced the QOL of women with osteoporosis. A cross-sectional study was conducted in 220 postmenopausal women (ages ranging from 55 to 80 years). Of the total number, 110 women had osteoporosis and 110 women did not have osteoporosis and these women were age-matched (±3 years). They reported that women with osteoporosis had an impaired QOL, especially relating to the physical, psycho-logical and social aspects. The factors associated with QOL were obesity, sedentary lifestyle and paid work [17].

Between QOL factors that were examined in this study, only the extramarital relations show significant difference in kyphosis group. The post hoc test show that this difference is between hypo normal and normal groups, So that you can see, the graph shows that the Hypo kyphosis group was significantly higher than normal group.

Further research should be done to investigate the differences between quality of life and abnormalities of the spine deal (kyphosis & lordosis) in young people.

CONCLUSION

According our findings, between QOL factors that were examined in this study, only the extramarital relations show significant difference in kyphosis group. QOL is not significantly affected by spinal deformities.

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