

Psychosocial Aspects in Girls with Idiopathic Precocious Puberty

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Objective Precocious puberty leads to discrepancies between physical and chronological age. The aim of the present study was to evaluate behavioral patterns and social competences in 34 girls with idiopathic precocious puberty.

Methods Height, body weight, and BMI were determined, and pubertal development was assessed. The Korean-child behavior checklist (K-CBCL) was completed by parents.

Results 1) Body weight and BMI were significantly higher in precocious puberty group than in the control group. 2) T scores of total social competence and school scales of K-CBCL were significantly higher in the precocious puberty group than in the control group. 3) T scores of externalizing problems and total behavior problems of K-CBCL were also significantly higher in the precocious puberty group. 4) T scores of thought problems and attention problems of K-CBCL were significantly higher in the precocious puberty group than the control group.

Conclusion Although girls with precocious puberty had more behavioral problems, no significant differences were observed between the two study groups in terms of clinically-important T scores. However, the concerns of parents and patients regarding behavioral and emotional changes might be most important when evaluating psychosocial problems. Early recognition, sufficient understanding, communication with patients and parents regarding physical developmental difference from children in the same age, can improve the self-image of those with precocious puberty.

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Key Words Precocious puberty, Psychosocial problem.

INTRODUCTION

Normal puberty begins with the stimulation of gonadotropin releasing hormone secretion by neurotransmitters in the hypothalamus that receives peripheral signals, such as, gonadotropin and leptin, environmental signals regarding nutritional condition, light, and stress, and signals from nervous system disrupters.¹ Puberty initiation age is affected by genetic characteristics, nutritional condition, obesity, environmental hormones, and stress. Recently, the puberty initiation age has reduced due to better nutrition caused by improved living statuses.² Accordingly, numbers of children with early onset puberty and of patients diagnosed with precocious puberty are increasing.³

Precocious puberty is characterized by conditions wherein secondary sexual developments occur in girls aged less than eight years and boys aged less than nine years. In precocious puberty, girls show breast enlargement, pelvis expansion, hair growth, and commence menstruation.⁴ Social interests in precocious puberty is gradually increasing because precocious puberty is known to cause short stature due to early closure of the growth plate.¹ In addition, faster physical development is regarded as bizarre by children of the same age, and it causes teasing problems with peer groups in a stage of immature superego.⁵

In addition, a study conducted on patients with early onset normal puberty, reported that self-stress due to a different body shape from the peer group, psychological concerns due to discrepancies between physical and chronological age, and long-term behavioral problems in school, sexual activity, and social adaptation could occur.⁶ Studies in female rats have suggested that sex steroids influence the central nervous system differentiation and affect behavior.^{7,8} However, in another study, it was concluded that precocious puberty patients does not have a severe psychopathology.⁹

As mentioned above, the results about psychosocial prob-

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lems in precocious puberty were different. In addition, there may be racial and cultural differences regarding perceptions about early physical development. Accordingly, this study was conducted to investigate the characteristics of precocious puberty and to assess the psychosocial impact of precocious puberty in precocious puberty group as compared with age and sex matched healthy controls.

METHODS

Subjects

Of the female pediatric patients diagnosed with idiopathic precocious puberty in the Department of Pediatrics, Chosun University Hospital from June 2010 to August 2010, 34 patients, whose parents agreed they could participate, were enrolled in this study. Separately, of first year female children in an elementary school in Gwang-san gu, 39 with no evidence of pubertal development by physical examination, and whose parents completed the Korean-Child Behavior Checklist (K-CBCL) were selected as controls.

Methods

Based on puberty initiation age in Korea, idiopathic precocious puberty was diagnosed in females exhibiting breast development at less than 8 years of age (sexual maturity rating of 2 or higher), an advanced bone age, a basal luteinizing hormone (LH) level of 0.6 IU/L or higher, and a peak LH level of 6.9 IU/L or higher in the luteinizing hormone releasing hormone stimulation test.¹⁰

Bone age was measured using the Greulich-Pyle method by examining plain radiographs of carpal bones of left hands.¹¹ Those with precocious puberty due to congenital anomaly, chronic diseases, brain's organic causes, congenital adrenal hyperplasia, hypothyroidism, or iatrogenic precocious puberty were excluded.

The K-CBCL, which is a scale developed to assess social adaptation, emotional, and behavior problems in children and

adolescents, consists of 120 questions that constitute a social competence scale and a behavioral problem scale.¹²

Data analysis

In this study, each question in the questionnaire was scored, and results were analyzed. Statistical analysis was performed using SPSS/WIN s/w 17.0 (Windows standard version 17.0, SPSS Inc., Chicago, IL, USA). The t-test was used to determine the significances of intergroup differences in gestational age, birth weight, height, weight, body mass index (BMI), economic status, total social competence, sociality, performance in school, internalizing problems, externalizing problems, and behavioral problems.

RESULTS

Mean age, gestational age, birth weight, and economic status were non-significantly different in the two groups. Mean height was greater in the patient group than in the control group, but this was not significant. Weight ($p < 0.001$) and BMI ($p = 0.001$) were significantly higher in the patient group (Table 1). The total social competence scale ($p = 0.048$) and school scale ($p < 0.001$) were significantly different in the two groups, but the social scale was not.

Scores of internalizing problems were non-significantly higher for patients, and in the internalizing problems sub-scale, scores of withdrawn, somatic complaints, and anxious/depressed were higher in patients, but no statistical differences were found. Scores of externalizing problems ($p = 0.029$) and total behavioral problem ($p = 0.008$) were significantly higher in the patient group than in the control group.

In the externalizing problems sub-scale, scores of delinquents and aggressive behaviors were non-significantly higher in the patient group. Scores of other behavioral problems, social problems, sex problems, and emotional liability were non-significantly higher for patients than controls. However, thought problem ($p = 0.010$) and attention problem ($p = 0.047$)

Table 1. Comparison of the clinical characteristics of the two groups

	Precocious puberty Mean (SD)	Control Mean (SD)	t	p-value
Age (year)	8.12 (0.64)	7.95 (0.22)	0.640	0.151
Gestational age (week)	39.71 (0.85)	39.41 (1.41)	1.096	0.277
Birth weight (kg)	3.23 (0.46)	3.17 (0.43)	0.545	0.588
Height (cm)	128.93 (7.26)	125.26 (5.40)	1.943	0.058
Body weight (kg)	29.64 (5.02)	24.11 (4.58)	3.736	0.000
Body mass index (kg/m ²)	17.77 (2.55)	15.30 (2.27)	3.665	0.001
Economic status	3.03 (0.76)	3.26 (0.60)	-1.432	0.157

SD: standard deviation

Table 2. Comparison of social competence, internalizing, externalizing and other behavior problems between the two groups

	Precocious puberty Mean (SD)	Control Mean (SD)	t	p-value
Total social competence	60.38 (8.492)	56.51 (7.681)	2.010	0.048
Social	56.06 (10.036)	56.49 (7.725)	-0.206	0.838
School	61.50 (3.172)	58.16 (3.963)	3.918	0.000
Internalizing problems	46.88 (7.896)	43.64 (7.054)	1.852	0.068
Withdrawn	49.24 (6.500)	46.82 (5.520)	1.717	0.090
Somatic complaints	46.76 (6.671)	46.08 (5.309)	0.469	0.640
Anxious/Depressed	46.44 (9.271)	43.46 (7.612)	1.508	0.136
Externalizing problems	45.88 (8.534)	41.67 (7.665)	2.223	0.029
Delinquent behavior	48.00 (6.348)	45.72 (4.779)	1.715	0.091
Aggressive behavior	45.27 (8.140)	42.18 (7.556)	1.670	0.099
Total behavior problems	45.97 (8.080)	40.62 (8.350)	2.751	0.008
Social problems	47.47 (10.538)	44.64 (6.393)	1.362	0.179
Thought problems	49.12 (6.623)	46.00 (0.000)	2.745	0.010
Attention problems	46.68 (8.584)	43.23 (5.887)	2.021	0.047
Sex problems	48.47 (5.501)	47.33 (3.996)	0.998	0.322
Emotional lability	43.65 (7.543)	41.03 (5.747)	1.682	0.097

SD: standard deviation

scores were significantly higher in patients than in controls (Table 2).

DISCUSSION

Nutritional condition and body composition play important roles in the occurrence of idiopathic precocious puberty. Body fat composition is known to induce puberty, and in particular, menarche begins earlier in obese girls, whereas it is delayed in patients with a nutritional deficiency or anorexia nervosa, or in athletes. Severe stresses in the family have also been reported to cause early puberty by corticotrophin releasing hormone.¹

In this study, weight and BMI were found to be significantly higher in the patient group than in the control group, suggesting that puberty is associated with weight.

A long-term study reported that sexual interest increases when menarche began earlier, and that in many cases, girls with early menarche met older boys and showed less interest in educational studies.^{13,14} However, several other studies have found that these girls have average to high-average IQ scores and do not have undue academic problems.^{15,16} In the present study, precocious puberty was not found to have a significant negative impact on study or social competence.

Some studies have reported that girls are concerned about breast development differences and that such differences may lower self-esteem, a feeling of being unhealthy, loneliness and depression.^{17,18}

Girls with early onset puberty without a diagnosis of precocious puberty, showed aggressiveness, conflict with parents, anti-social behavior, poor school performance (leading to withdrawal from school in severe cases), getting along with older friends, and increased prevalence of venereal diseases or teen pregnancy.¹⁹⁻²² According to a study conducted on girls with menarche at less than 11 years of age, they showed more drug and alcohol intake, experienced a first sexual relationship earlier, and committed more crimes when 15-16 years of age than girls with delayed menarche.^{16,23} In another study girls with an early menarche were found to have considerably more psychosomatic symptoms during menstruation due to hormonal fluctuations.²⁴

However, other studies have concluded that precocious puberty in girls is not associated with psychiatric disturbance, and that such girls only experience dysphoria due to their physical condition and the in such girls psychosexual behavior follows chronologic age not physical age.^{25,26}

Similarly, in the present study, scores of externalization problems and total behavioral, thought, and attentional problem scores were higher in the patient group, whereas T scores were not clinically important.

The results of this study are likely to be attributable to the fact that no behavior or social problems occurred immediately after physical development upon the secretion of sex hormones. During the adolescent development process, physical development rapidly increases during the early stage, and an interest in the opposite sex, conflict between self-indepen-

dence and dependence on parents, and emotional changes increase during the middle stage. Identity is finally established during the late stage.⁵

Therefore, in girls with precocious puberty during the early stage of physical change, psychosocial problems are likely to occur over time rather than immediately. Externalizing problems is clearly shown by adolescents during the middle and late period, or by high school students. Since physical development timing is not consistent with behavioral problem initiation timing during early puberty, it is difficult to assess the association between psychosocial problem initiation and biological development initiation.²⁷ Some studies on the psychosocial aspect of precocious puberty differ from ours, because they included boys and girls, and the etiologies of precocious puberty were mixed.

We conclude that although girls with precocious puberty present greater behavioral problems, no significant differences were seen between the precocious puberty group and the control groups in terms T score elevation. Clinically significant T score are important for assessments of behavior problems in precocious puberty using the K-CBCL but behavioral and emotional changes are the most important concerns of parents and patients. Therefore, the early recognition, sufficient understanding, and communication about physical development rates that differ from the norm are required for patients, parents, and medical care providers. Furthermore, patients should provide psychological support for the perception of a healthy self-image in patients. Longitudinal studies on changes in psychosocial problems and on the differences in the effects of GnRH agonist are required in patients with precocious puberty.

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