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Analysis of Influencing Factors on Bone Maturation in Girls with Central Precocious Puberty(CPP)

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Background & Objective

:The occurrence of CPP seems to be increasing in our clinical practice these days. It is known that CPP causes socio-psychological disturbances relating to early pubertal changes and finally leads to a significant decrease in the final adult height because of premature closure of the growth plate. This study was conducted to see major factors affecting to the bone maturation, which is closely related to the final adult height in girls with CPP.

Material & Methods

:The study patients consisted of 164 girls who was diagnosed with CPP for previous 5 yrs in the department of Pediatric Endocrinology Kyungpook National University Children's Hospital, Daegu, Republic of Korea. The diagnosis of CPP was made when the patient showed the first pubertal sign of breast enlargement before the age of 8 years, and peak LH> 5 mIU / mL in GnRH stimulation test. We compared and analyzed relations between the severity of bone-age advancement and various clinical and laboratory characteristics retrospectively.

Results

:The chronological age(CA) of study patients was 7.18±0.82 yrs, and their bone age(BA) was 8.66±1.33 yrs. We compared various clinical & laboratory data with Δ BA-CA(yr) to find out factors affecting the bone maturation. The statistically significant correlation was observed between Δ BA-CA(yr) and peak LH/FSH ratio(r=0.416 p=0.000). And there was also a relationship between basal LH, basal FSH, peak LH and Δ BA-CA(yr). However, the correlation was basal LH (r=0.373 P=0.000), peak LH (r=0.340, P=0.000) which was lower than peak LH/FSH ratio. And basal FSH showed significantly inverse correlation with Δ BA-CA(yr) (r=-0.216, P=0.005). No other significant correlation was observed with anthropometry data, FSH in our patients.

Conclusions

:It appears that the bone-age advancement was significantly most correlated with the peak LH/FSH ratio in girls with CPP. This suggests that the peak LH/FSH ratio is one of key indicators related to bone maturation. Large-scaled studies are neccessary.

Characteristic	Girl(n=164)	P-value *
CA(yr)	7.18±0.82	0.000
BA(yr)	8.66±1.33	0.000
BA-CA(yr)	1.49±0.96	0.000
CA/BA ratio	0.20±0.14	0.000
Basal LH(mIU/mL)	0.31±0.71	0.000
Peak LH(mIU/mL)	11.50±11.38	0.000
Basal FSH(mIU/mL)	3.07±1.46	0.000
Peak FSH(mIU/mL)	19.61±7.04	0.000
Peak LH/Peak FSH	0.66±0.65	0.000

Table 1. Clinical and laboratory characteristics study groups.
CA=chronological age, BA=Bone age

Parameter	Δ BA - CA	
	r	P-Value
Basal LH(mIU/mL)	0.373	0.000
Peak LH (mIU/mL)	0.340	0.000
Basal FSH(mIU/mL)	0.078	0.323
Peak FSH(mIU/mL)	-0.216	0.005
Peak LH/Peak FSH	0.418	0.000

Table 2. Pearson correlation coefficients of multiple factors to bone age advancement.

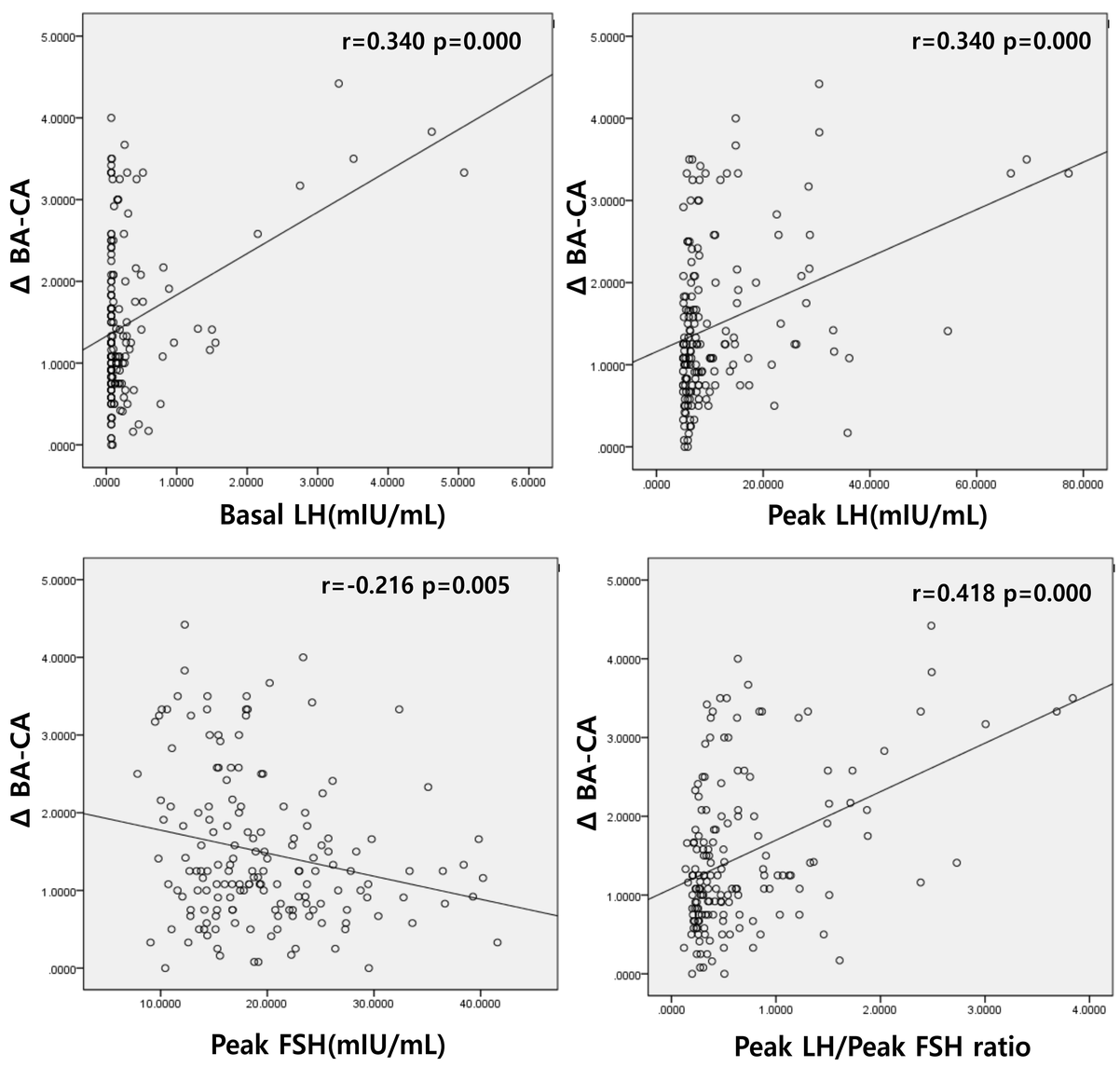

Fig 1. Pearson correlation analysis demonstrating most correlated between ΔBA-CA and Peak LH/ Peak FSH.