

BACKGROUND

- Puberty is associated with a physiological decline in insulin sensitivity. Overweight and obesity are common among girls with Central Precocious Puberty (CPP). CPP and early menarche have been considered as risk factors for obesity and cardiovascular diseases during adulthood. A recent study indicated that the effect of early menarcheal age on adult cardiovascular risk may be ascribed to high childhood adiposity. Besides, concern has been raised by the potential impact of GnRH analogues (GnRH-a) treatment on body weight and metabolic profile.

OBJECTIVE

- To evaluate BMI and metabolic parameters in CPP girls at diagnosis and during GnRH treatment.

PATIENTS AND METHODS

A prospective longitudinal single cohort study

15 CPP girls evaluated at diagnosis and at 6 months on GnRH treatment by Oral glucose tolerance test (OGTT)



Inclusion criteria:

- ✓ Onset of breast development before 8 years of chronological age (CA),
- ✓ Height velocity above the 97 centile for age
- ✓ Bone age (BA) advancement by at least one year over CA,
- ✓ Pubertal LH response to GnRH (≥ 6 mUI/ml),
- ✓ Uterine length ≥ 35 mm.

Exclusion criteria:

- ✓ Organic Central Precocious Puberty,
- ✓ Congenital Adrenal Hyperplasia
- ✓ Any other underlying condition or medication that might affect body weight or metabolic profile.

At diagnosis GnRH analogue treatment At 6 months

- Glucose and insulin levels were measured at 0, 30, 60, 90 and 120 minutes.
- Surrogate indices for fasting (SFI) insulin resistance (IR) [HOMA-IR, G/I, QUICKI] (were evaluated according to own local cutoff ¹)
- Matsuda Index.
- Fasting lipid profile (was evaluated according to A.A.P recommendations ²)

RESULTS

At diagnosis 15 CPP girls

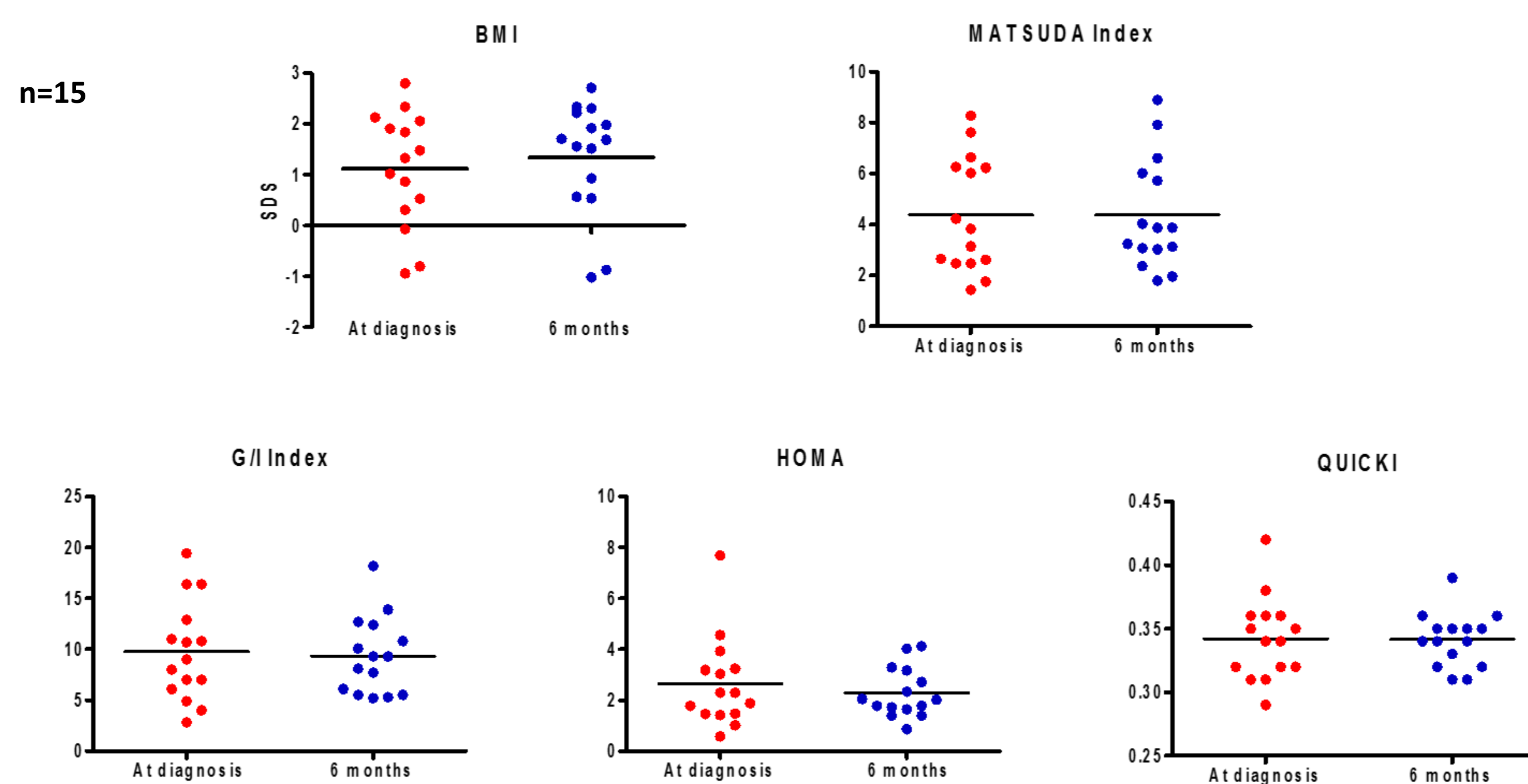
Median CA 7.8 years (range 5.7-8.5)
Median BA 10 years (range 6.8-12)
Tanner stage III
Normal weight n=8 Overweight or obese n= 7

Table 1: BMI and metabolic profile at diagnosis and at 6 months of GnRH treatment

n=15	At diagnosis	6 months	p value
BMI-SDS	1.12 ± 0.29	1.34 ± 0.28	ns
HOMA	2.65 ± 0.46	2.28 ± 0.25	ns
QUICKI	0.34 ± 0.00	0.34 ± 0.00	ns
G/I Index	9.76 ± 1.25	9.34 ± 0.97	ns
Matsuda Index	4.37 ± 0.58	4.37 ± 0.56	ns
AUC Glucose	14939 ± 448	14194 ± 443	ns
AUC Insulin	8367 ± 1219	8714 ± 1262	ns
2 Impaired SIF	6/15	4/15	ns
Impaired Matsuda	3/15	3/15	ns
Dislipidemia	4/15	2/15	ns

Data are expressed as mean ± SE
SFI cutoff for normal Argentinian girls:
HOMA 1.6 (0.3-2.6), QUICKI 0.36 (0.31-0.47), G/I index 12 (7.9-44)

Figure 1: Evolution of BMI, SFI and Matsuda Index between diagnosis and 6 months of treatment



CONCLUSIONS

Our cohort of CPP girls showed a high frequency of OW and OB as well as high prevalence of IR. BMI and metabolic profile did not show changes at six month of GnRH treatment. Further studies will be necessary to determine long term metabolic risk in these patients.

References:

- 1-Insulin level and insulin sensitivity indices among healthy children and adolescents. Ballerini M.G. et al. Arch Argent Pediatr 2016; 114(4):329-336
- 2-NCEP Expert Panel of Blood Cholesterol Levels in Children and Adolescents. National Cholesterol Education Program (NCEP): Highlights of the Report of the Expert Panel on Blood Cholesterol Levels in Children and Adolescents. Pediatrics. 1992;89:495-501.
- 3-Insulin sensitivity and lipid profiles in girls with central precocious puberty before and during gonadal suppression. Sørensen K, Mouritsen A, Mogensen SS, Aksglaede L, Juul A. J Clin Endocrinol Metab. 2010 Aug;95(8):3736-44
- 4-Higher prevalence of obesity and overweight without an adverse metabolic profile in girls with central precocious puberty compared to girls with early puberty, regardless of GnRH analogue treatment. Colmenares A, Gunczler P, Lanes R. Int J Pediatr Endocrinol. 2014;2014(1):5. doi: 10.1186/1687-9856-2014-5. Epub 2014 Apr 17.

