

Precocious puberty in the obese child as a diagnostic challenge

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OBJECTIVES

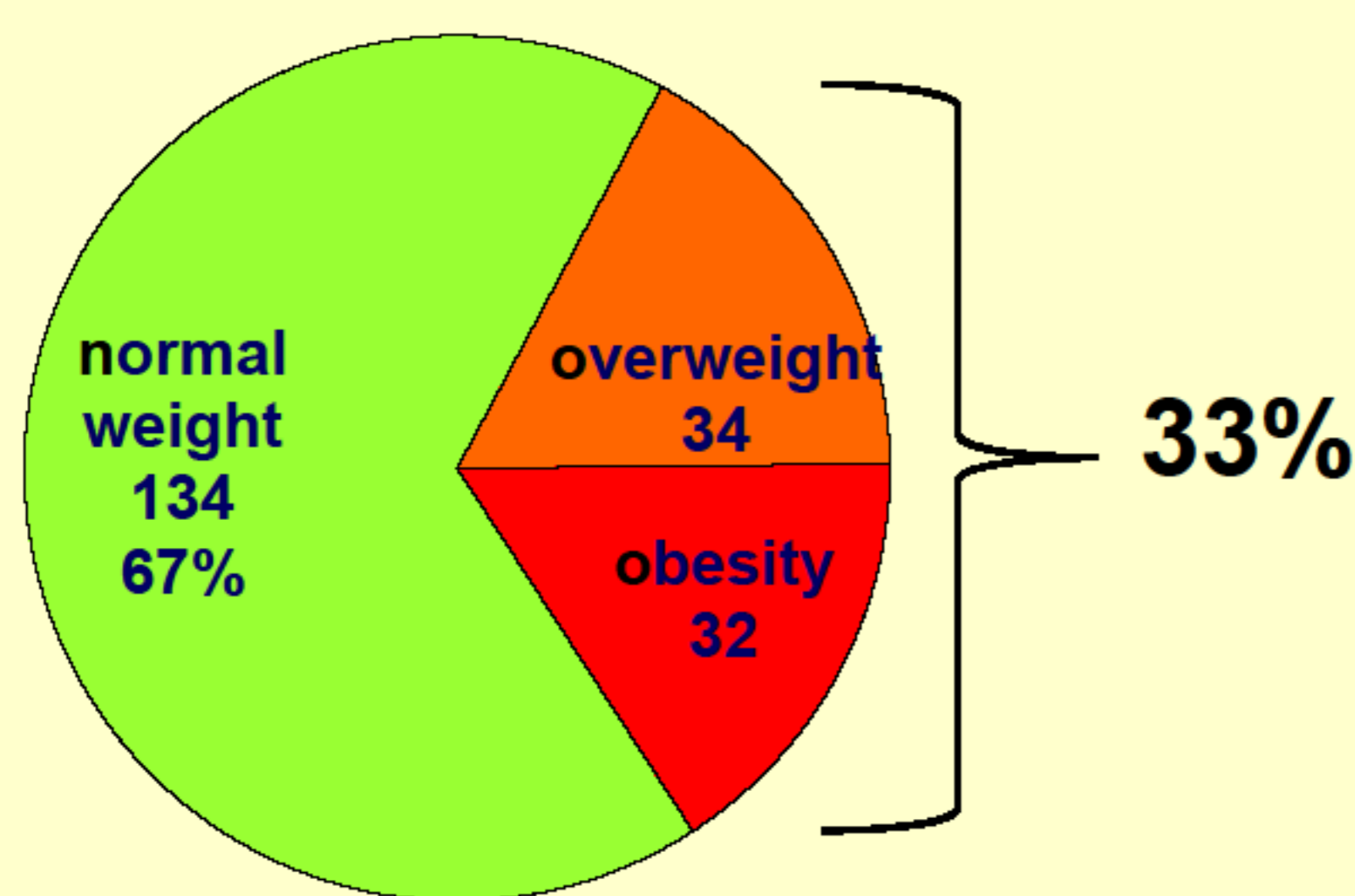
Precocious puberty (PP), defined as puberty features occurring before 8 years of age in girls and 9 years in boys, requires a detailed diagnosis. It is concerned that the most useful parameter to differentiate central precocious puberty (CPP) from isolated mild variants is the bone age (BA). On the other hand, obesity in childhood can accelerate physical development. The aim of this study was to evaluate whether the coexistence of obesity in children with precocious puberty symptoms influences significantly the diagnostic process.

METHODS

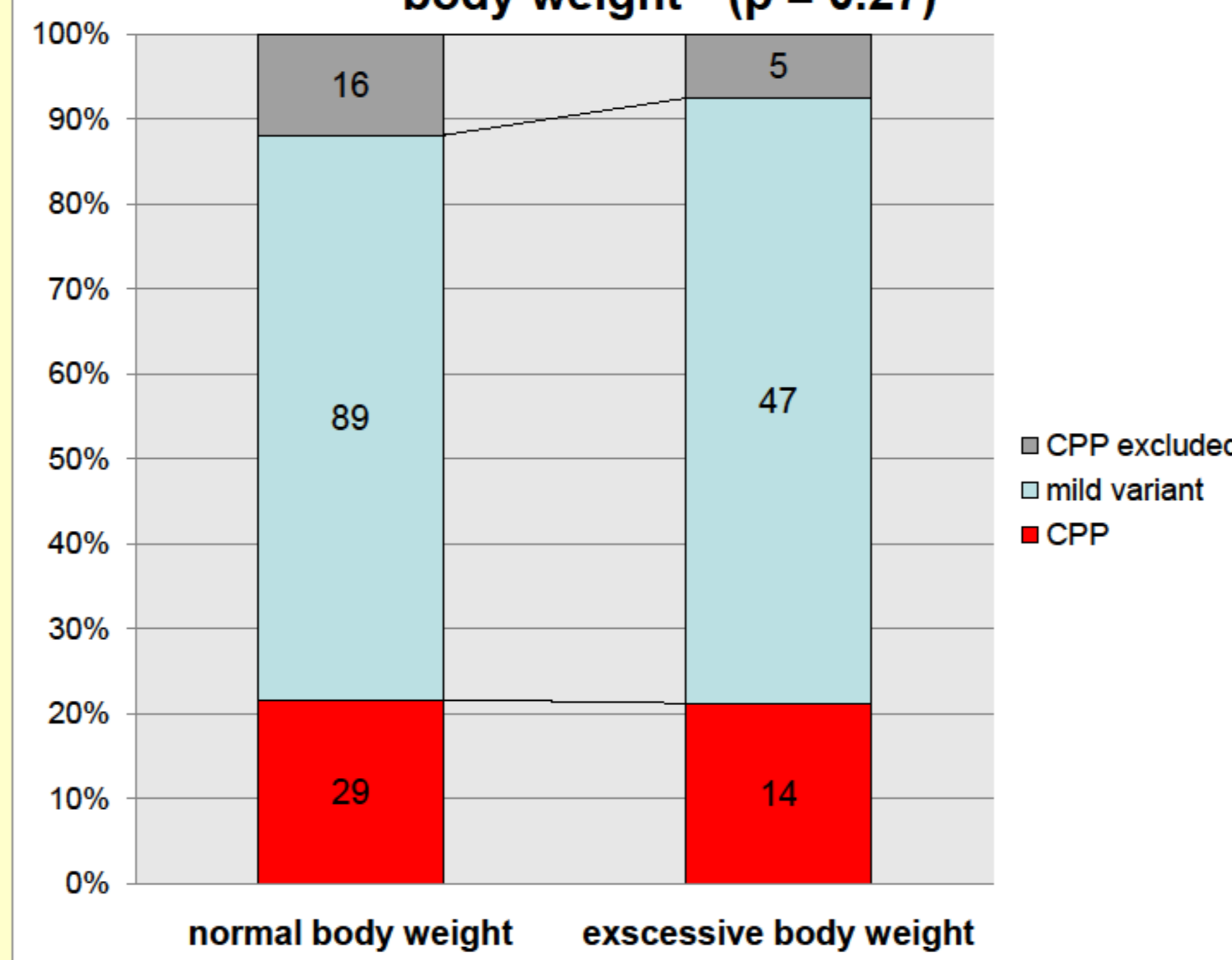
- Retrospective analysis included records of 200 children (F/M 164/36) hospitalized because of precocious puberty suspicion in the Department of Pediatric Endocrinology Medical University of Silesia between 2005 and 2011 year.
- The nutritional status, based on Polish BMI centile charts, was diagnosed as overweight in the range between 90 and 97 percentile for age and sex, and obesity > 97pc
- Bone age and its compatibility with chronological age was evaluated on the basis of a Greulich & Pyle atlas
- The analysis also included final clinical diagnoses

RESULTS

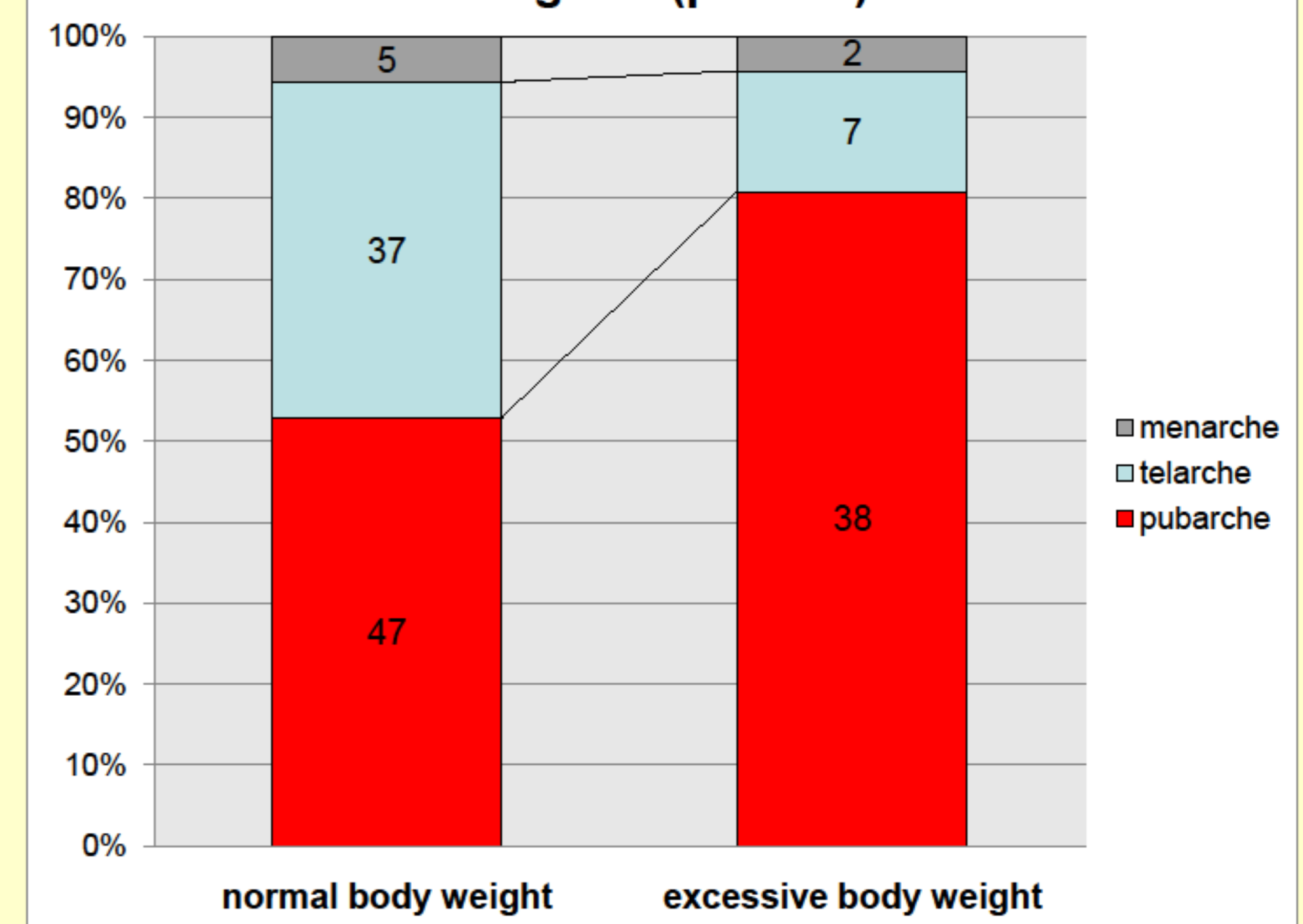
Anthropometrical status in the study group



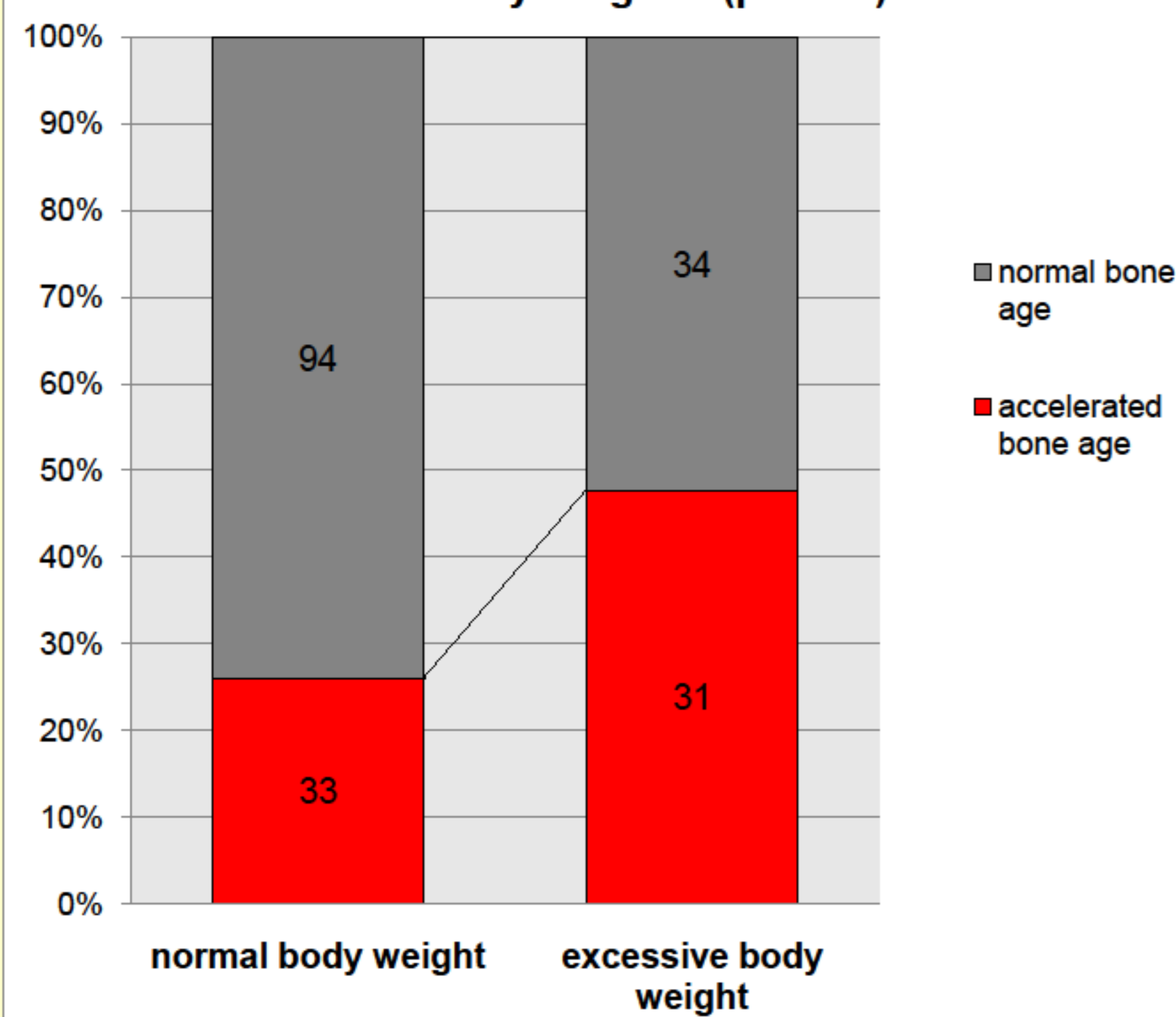
CPP incidence in patients with excessive body weight *(p = 0.27)



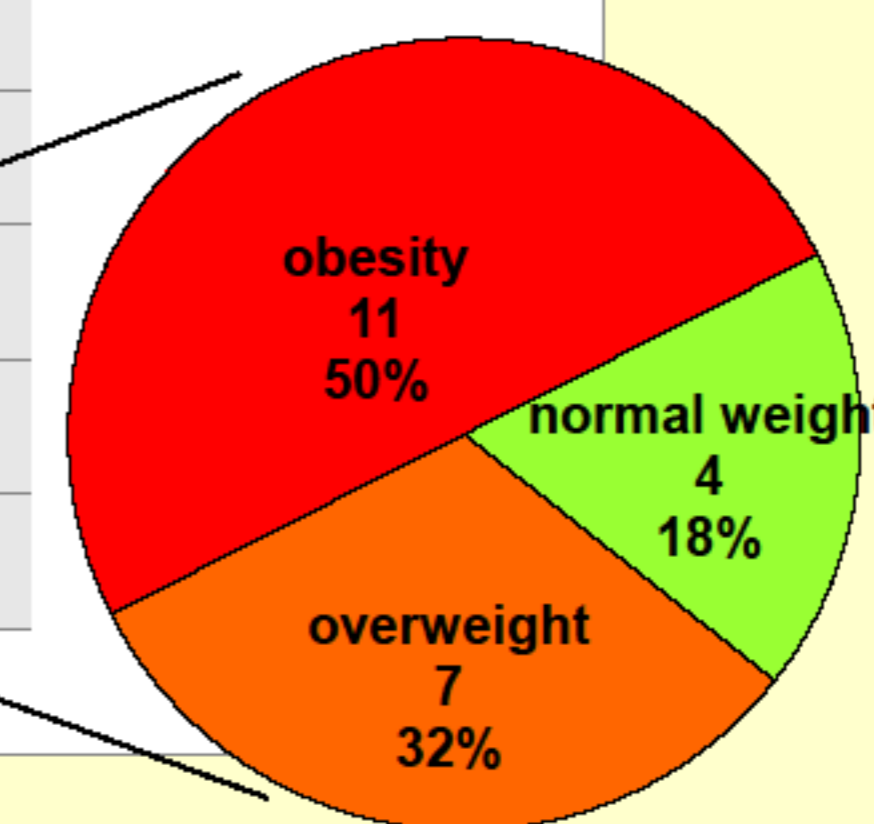
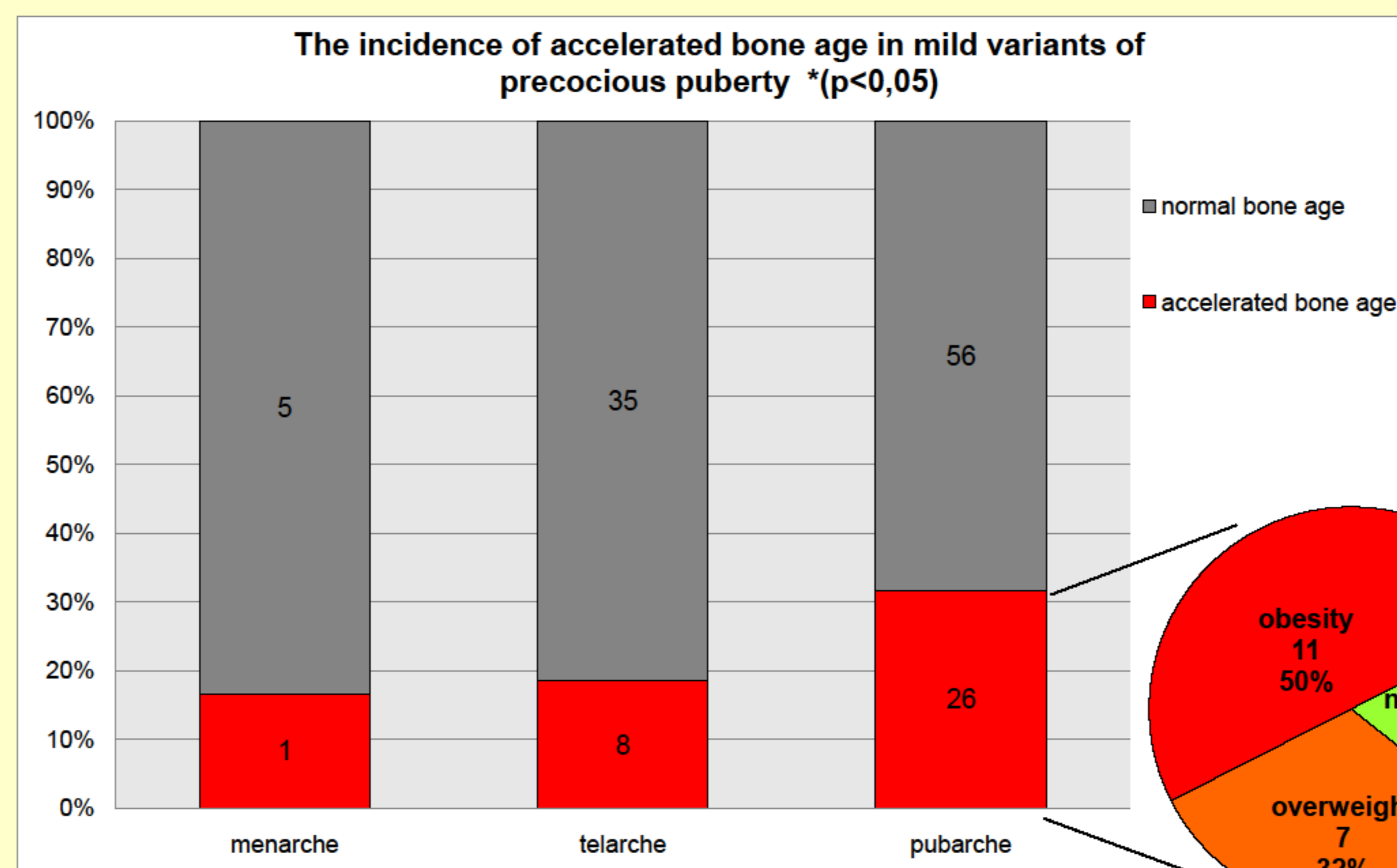
The incidence of mild variants of precocious puberty depending on body weight *(p < 0.01)



The incidence of accelerated bone age depending on body weight *(p < 0.01)



The incidence of accelerated bone age in mild variants of precocious puberty *(p < 0.05)



Acceleration of bone age (10-11 years by Greulich-Pyle) in 7-year-old girl with a mild variant of precocious puberty (precocious pubarche)

In the analyzed group excessive body weight was found in 66 (33%) children, - overweight in 34 (17%) and obesity in 32 (16%) patients respectively. It is noticeable that children with excessive body weight are significantly more likely to have mild variants of precocious puberty (71% vs. 66.4%) despite the fact that the accelerated bone age in this group was more frequently observed (47% vs. 24.6%). In the group with mild variant of PP and accelerated bone age (n = 41 (28.9%)) up to 75.6% of children were overweight or obese. In the group of CPP accelerated BA was observed only in 23 (52.3%) children. Frequently recognized variant of PP in obese children was premature pubarche (n = 20 (62.5%)).

CONCLUSIONS

Obesity and overweight significantly modifies puberty, and by accelerating the bone age can hinder the initial diagnosis of PP. The bone age acceleration seems to be poor indicator of central precocious puberty, especially in obese children. The population of overweight and obese children is dominated by a mild variant of precocious puberty – premature pubarche.

References

1. Tomova A et al.: Influence of the body weight on the onset and progression of puberty in boys. J Pediatr Endocrinol Metab 2015 doi: 10.1515/jpem-2014-0363. [Epub ahead of print]
2. Dunger DB et al.: Effects of obesity on growth and puberty. Best Pract Res Clin Endocrinol Metab 2005; 19: 375-390.
3. Jasik CB et al.: Adolescent obesity and puberty: the „perfect storm”. Ann N Y Acad Sci 2008; 1135: 265-279.

