

Metabolic syndrome in children and adolescents with arterial hypertension

A single center, cross-sectional study

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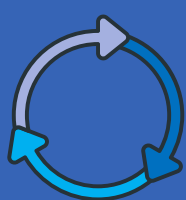
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Purpose of the study

The purpose of the study was to determine prevalence of metabolic syndrome (MS) in children and adolescents with arterial hypertension (HT)



Material and methods

Study included 2010 patients hospitalized in Children's Memorial Health Institute (2012–2022)

All patients underwent complete hypertension diagnosis process including:

- anthropometric measurements,
- office blood pressure measurements,
- basic laboratory tests,
- imaging tests

Fig. 1. Number of patients with MS in relation to age

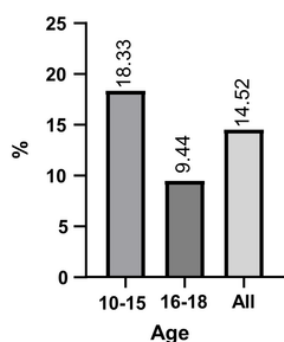


Fig. 2. Number of patients with MS in relation to the type of HT

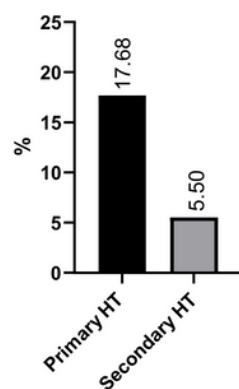


Fig. 3. Comparison of MS diagnosis between polish and IDF criteria in different age groups

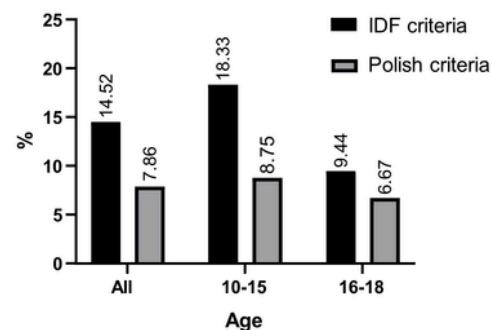


Fig. 4. Comparison of MS diagnosis between polish and IDF criteria in different types of HT

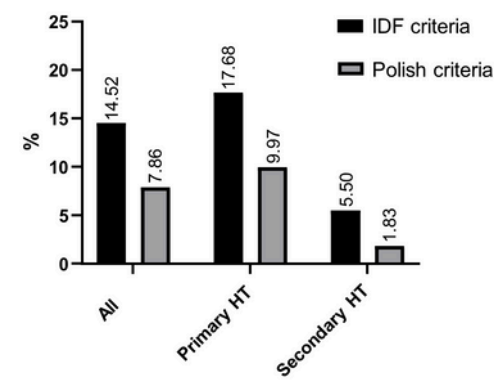


Table 1. Comparison of polish and IDF criteria for metabolic syndrome diagnosis

Fig. 5. Serum UA level in patients in relation to the type of HT

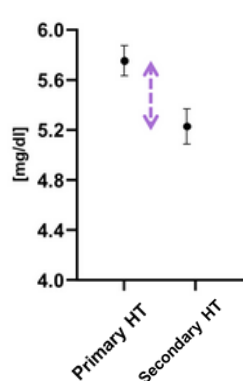
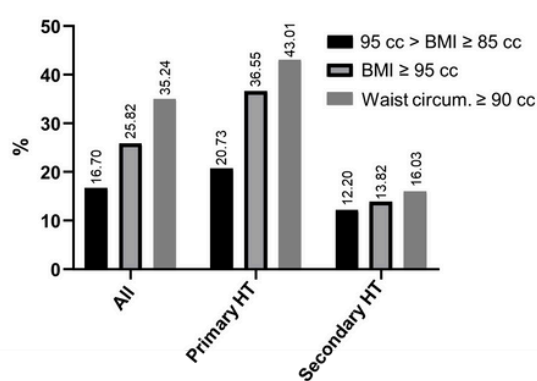


Fig. 6. Number of overweight, obese and with increased waist circumference patients in relation to the type of HT



Results

In the analyzed group 14,52% was diagnosed with MS (18,33% in 10–15 y/o and 9,44% in 16–18 y/o). Moreover MS was diagnosed in 17,68% patients with primary HT (PH) and 5,50% with secondary HT (SH). Overweight, obesity and increased waist circumference were more common in PH, while TG and glucose abnormalities were more pronounced in SH. Compared to the 14,52% of patients diagnosed with MS using IDF criteria, the Polish criteria identified only 7,86% of these patients as having MS. Uric acid (UA) level in PH and SH group was respectively 5,7 mg/dL and 5,2 mg/dL. In addition the difference in those values was greater after excluding the patients with nephrogenic and post kidney transplantation hypertension (5,7 mg/dL for PH patients and 4,6 mg/dL for SH). Furthermore UA level in serum was significantly higher in the group of patients with MS.

Conclusions

- MS was diagnosed more frequently in children aged 10–15 y/o than 16–18 y/o
- MS was more frequent in patients with PH than in SH
- Waist circumference primarily drives differences in MS diagnosis rates between PH and SH
- Polish criteria for diagnosis of MS decrease the number of patients diagnosed with MS in comparison to IDF's criteria
- Serum uric acid level was significantly higher in patients with PH than SH

Polish

IDF

Abdominal obesity (measured with waist circumference)

- | | |
|--|---|
| <ul style="list-style-type: none"> • ≥ 88 cm women & ≥ 102 cm men | <ul style="list-style-type: none"> • ≥ 90 cc or ≥ adult cut off (10–15 y/o) |
| OR | <ul style="list-style-type: none"> • ≥ 94 cm ♂ & ≥ 80 cm ♀ (≥16 y/o) |
| <ul style="list-style-type: none"> • BMI ≥ 30 kg/m² | <ul style="list-style-type: none"> • Diagnosis not possible if <10 y/o |
| + 2 criteria | |
| <ul style="list-style-type: none"> • Prediabetes or diabetes • Elevated non-HDL cholesterol level • SBP ≥130 mmHg or DBP ≥85/80* mmHg | <ul style="list-style-type: none"> • TG ≥150 mg/dl or HTG treatment • HDL <40 mg/dl ♂ or <50 mg/dl ♀ • SBP ≥130 mmHg or DBP ≥85 mmHg • Glycemia ≥ 100mg/dl or DM2 |

SBP – systolic blood pressure, DBP – diastolic blood pressure, TG – tryglicerides.
HTG – hypertrygliceridemia, DM2- diabetes mellitus type 2