

“PERCENTILES OF PLASMA COPEPTIN DISTRIBUTION IN PAEDIATRIC AGE: A USEFUL DIAGNOSTIC TOOL IN AVP-RELATED DISORDERS.”

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Background

Copeptin is a stable AVP surrogate, secreted in equimolar relationship, who has been proposed for the diagnosis of AVP-related hypo and hypernatremic disorders, i.e. the syndrome of inappropriate ADH secretions (SIADH), the cerebral/renal salt wasting syndrome (C/RSW) and diabetes insipidus (DI). Few data exist about the normal ranges for plasma copeptin levels in the pediatric age, reported between 2.4-8.6 pmol/L. The aim of this study is to represent the plasma copeptin distribution in a large pediatric cohort.

Objective

The aim of this study is to represent the plasma copeptin distribution in a large pediatric cohort.

Patients and methods

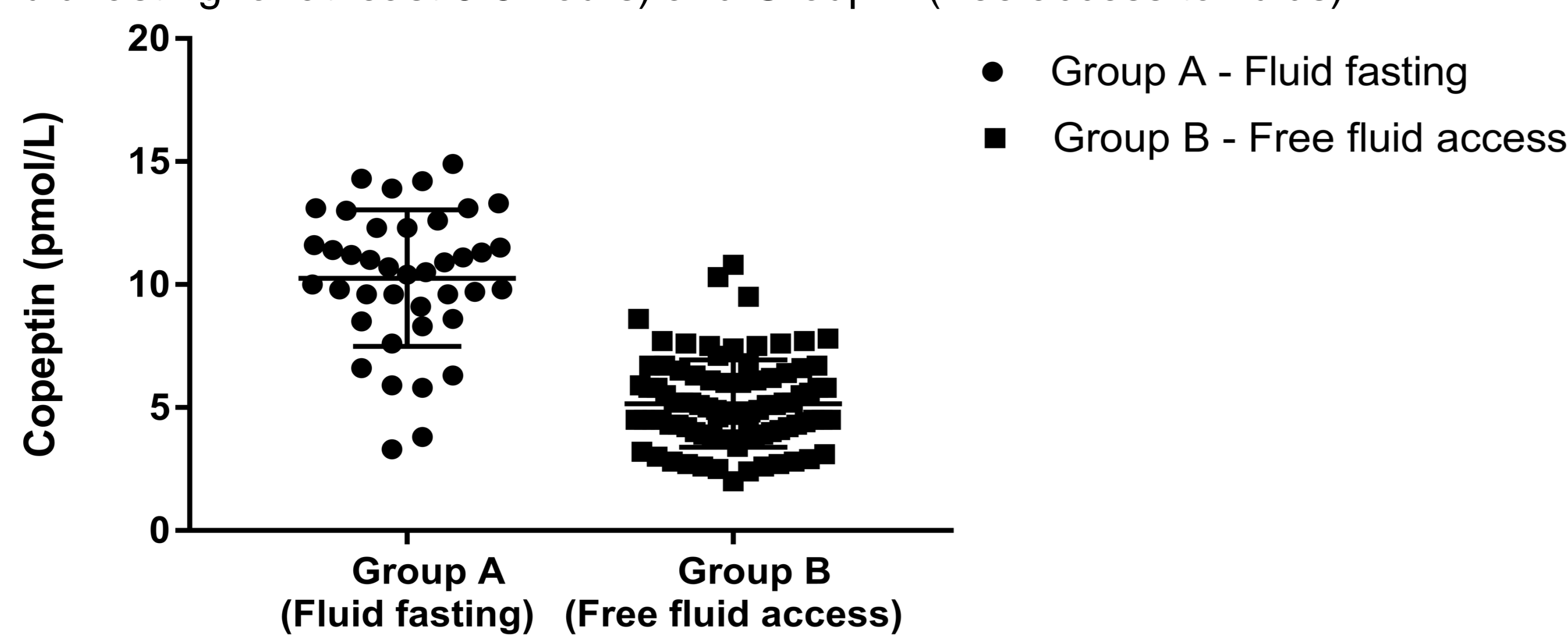
Plasma copeptin levels have been measured in 128 children and adolescents referred for other diseases than AVP-related disorders to the Department of Pediatric Endocrinology of Regina Margherita Children's Hospital in Turin in the period July 2016-May 2018. Plasma sample for copeptin analysis was collected early in the morning and the cohort was then splitted on the basis of recorded ingested fluid in the 6-8h before the sampling: Group A, with fluid fasting, Group B with free access to fluids.

Results

In the studied cohort plasma sodium level was 141.3 ± 1.63 in Group A (n=40) whereas in Group B (n=80) was 140.5 ± 1.81 ($p=0.02$) [Table 1]. Significant difference was observed between the two groups also for plasma osmolality (285.6 ± 5.89 vs 283.5 ± 2.99 respectively, $p=0.008$). Mean plasma copeptin level was 6.76 ± 3.18 pmol/ (range 2-14.9 pmol/L). No difference was present among boys (n=42) and girls (n=86), displaying 6.96 ± 0.5 and 6.65 ± 0.34 values, respectively ($p=0.61$). Plasma copeptin levels in Group A were 10.26 ± 0.43 pmol/l, in Group B 5.16 ± 0.18 pmol/L ($p<0.001$) [Figure 1]. In all distribution percentiles copeptin levels were higher in children and adolescents with nocturnal liquid fasting (3th percentile 3.42 vs 2.47 pmol/L; 5th percentile 3.9 vs 2.6 pmol/L; 10th percentile 5.94 vs 2.8 pmol/L; 25th percentile 8.73 vs 4 pmol/L; 50th percentile 10.6 vs 4.9 pmol/L; 75th percentile 12.3 vs 6.18 pmol/L; 90th percentile 13.84 vs 7.6 pmol/L; 95th percentile 14.3 vs 8.24 pmol/L; 97th percentile 14.76 vs 9.76 pmol/L) [Table 2].

	Group A	Group B	P value
Overall population (n.)	40	88	-
Boys (n.)	15	27	-
Girls (n.)	25	61	-
Age (years)	9.62 ± 3.85	9.68 ± 3.18	0.61
Plasma sodium (mmol/L)	141.3 ± 1.63	140.5 ± 1.81	0.02
Plasma Osmolality (mOsm/kg)	285.6 ± 5.89	283.5 ± 2.99	0.008
Plasma Copeptin (pmol/L)	10.26 ± 0.43	5.16 ± 0.18	<0.0001

Table 1. Demographic and biochemical features of the studied population; Group A (fluid fasting for at least 6-8 hours) and Group B (free access to fluids)



Percentiles	Overall population (pmol/L) (n=128)	Group A (pmol/L) (n=40)	Group B (pmol/L) (n=88)
3 th	2.59	3.42	2.47
5 th	2.7	3.9	2.6
10 th	3.19	5.94	2.8
25 th	4.43	8.73	4
50 th	5.85	10.6	4.9
75 th	9.4	12.3	6.18
90 th	11.51	13.84	7.6
95 th	13.1	14.3	8.24
97 th	13.94	14.76	9.76

Table 2. Distribution of plasma copeptin in percentiles.

Conclusions

Since plasma copeptin represents an emerging tool to investigate sodium and osmolality derangements, its evaluation should be included in the diagnostic flow-chart of AVP-related disorders. However, due to the extreme sensitivity of this parameter, in the interpretation of its levels, oral or intravenous administered fluids should be accurately considered.



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