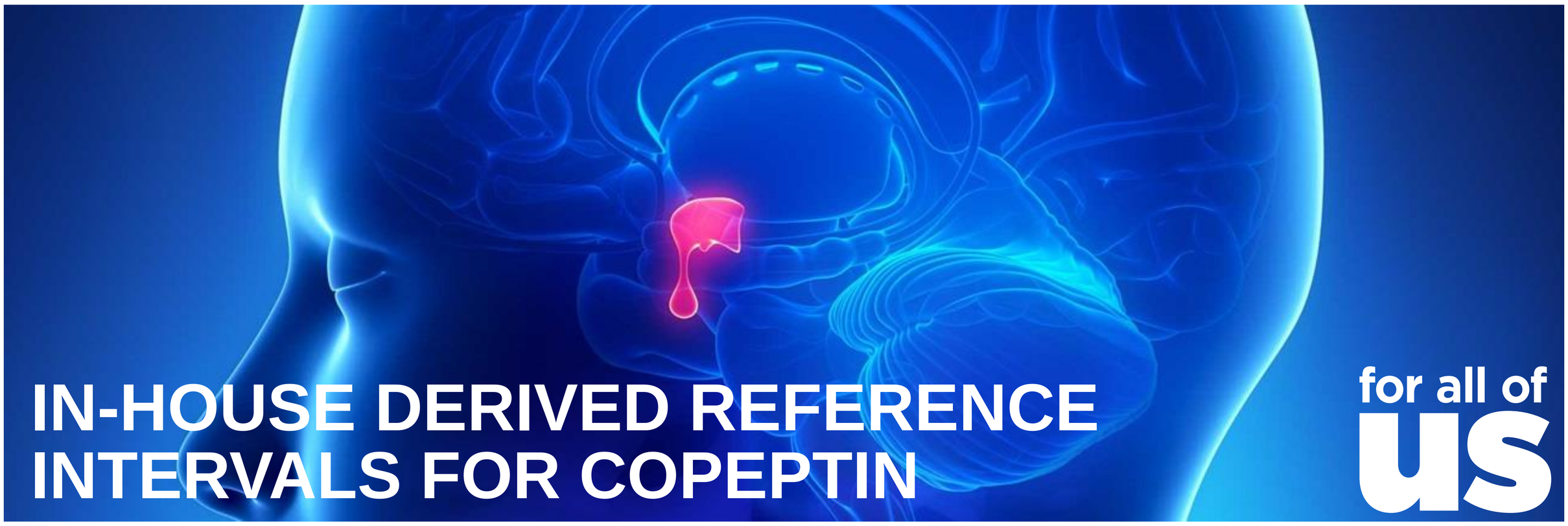

IN-HOUSE DERIVED REFERENCE INTERVALS FOR COPEPTIN

for all of us

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Introduction

Copeptin is a 39 amino acid glycoprotein produced in the hypothalamus and stored in the posterior pituitary gland. It is co-secreted in equimolar concentrations with vasopressin in response to increases in plasma osmolality or other psychogenic factors such as fear and pain. Plasma Copeptin is stable at 4°C for 14 days and does not require stringent pre-analytical conditions like vasopressin[1]. Therefore, Copeptin can be used as a surrogate marker for vasopressin.

Aim

Our laboratory recently verified the BRAHMS Thermofisher ProAVP/ Copeptin assay to replace the Anti-diuretic hormone assay. Adoption of the manufacturer's reference intervals is common practice, however, the reference intervals indicated in the package insert is not clear. Instead, we derived our own reference intervals according to the CLSI guidelines EP-28-A3C[2].

Method

125 blood samples from 'healthy' subjects were analysed for Copeptin on the BRAHMS Thermofisher Compact Plus:

- 6 healthy laboratory staff
- 41 patients coming through the emergency department for investigations of non-medically related illness with no known comorbidities
- 19 external referred patients for chromogranin A and were negative
- 59 external referred patients for thyroid receptor antibodies and were negative.

Non-parametric analyses were performed using the Medcalc and GraphPad statistical software.

Results

5 results were identified as outliers according to Tukey (1977) outlier detection and were therefore excluded from analysis.

Box-Cox transformation of the data indicated there were no diseased patients amongst the group.

Our population reference interval for a non-fasting, non water-deprived status is 1.1 to 16.3 pmol/L (median of 3.6 pmol/L).

A significant difference was observed between females and males with males having a higher Copeptin range than females and agrees with the literature[3].

There is no difference in Copeptin levels in people who are euthyroid, hypothyroid or hyperthyroid (data not shown). However, numbers of each group is too small to judge if this is statistically significant.

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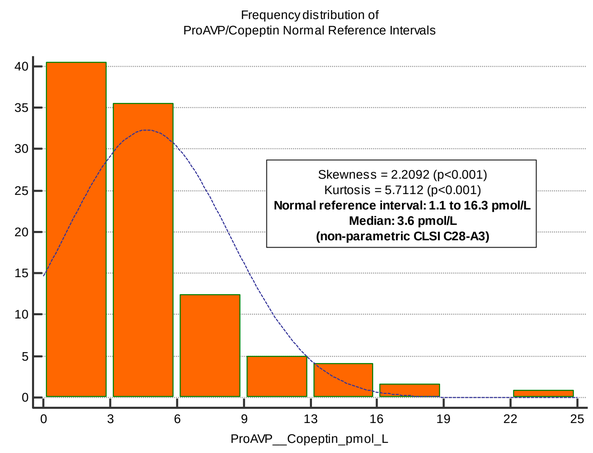

Figure 1: Histogram showing the distribution of Copeptin levels in the normal group.

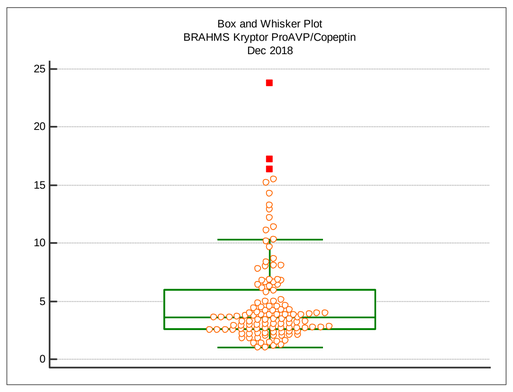

Figure 2: Box and Whisker Plot of the distribution of Copeptin levels in the normal group. Median: 3.6 pmol/L; 25th percentile : 2.6 pmol/L and 75th percentile 6.0 pmol/L. The filled squares indicates far-out values (included in analysis).

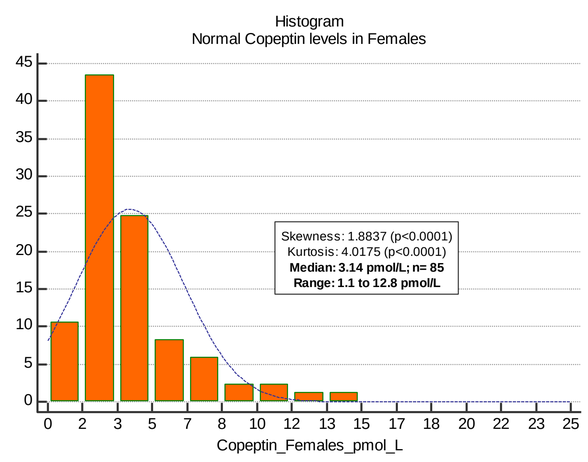

Figure 3: Histogram illustrating the distribution of Copeptin levels in females.

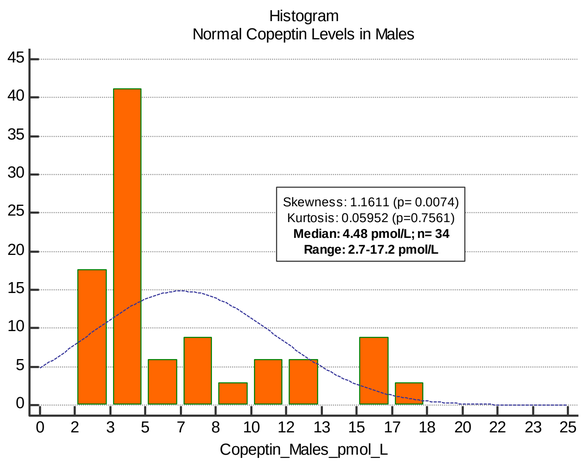

Figure 4: Histogram illustrating wider distribution of Copeptin levels in males.

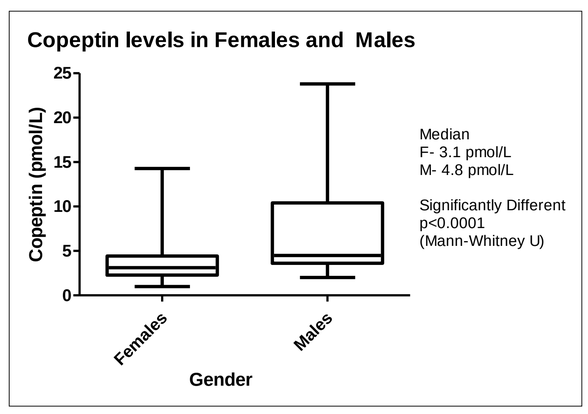

Figure 5: Box and Whisker plot comparing the difference in distribution of both sexes. Males have a slightly higher level than females.

Conclusion

Our in-house derived reference intervals for Copeptin were similar when compared to those published in the literature (0.3-18 pmol/L)[4].

Although we demonstrated there is a difference between gender, we have not adopted this in our routine laboratory due to insufficient numbers of each group. We hope to review and adopt a gender specific range in the future.

Copeptin measurement is now incorporated into the AACB Endocrine Harmonised Dynamic Testing (HEDT) as an alternative marker for the diagnosis of Diabetes Insipidus.

References

1. Morgenthaler, N.G., Struck, J., Alonso, C. and Bergmann, A., 2006. Assay for the measurement of copeptin, a stable peptide derived from the precursor of vasopressin. *Clinical chemistry*, *52*(1), pp.112-119.
2. CLSI EP28. Defining, Estabilishing, and Verifiying Reference Intervals in the Clinical Laboratory,3rd Edition. https://clsi.org/standards/products/method-evaluation/documents/ep28/
3. Bhandari, S.S., Loke, I., Davies, J.E., Squire, I.B., Struck, J. and Ng, L.L., 2009. Gender and renal function influence plasma levels of copeptin in healthy individuals. *Clinical Science*, *116*(3), pp.257-263.
4. Struck, J., Morgenthaler, N.G. and Bergmann, A., 2005. Copeptin, a stable peptide derived from the vasopressin precursor, is elevated in serum of sepsis patients. *Peptides*, *26*(12), pp.2500-2504.

Acknowledgements

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