

# The role of plasma C Peptide concentration in the diagnosis of Congenital Hyperinsulinism (CHI)

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## BACKGROUND

- The hallmark of CHI is the demonstration of detectable plasma insulin during hypoglycaemia
- Plasma insulin can be undetectable in a significant proportion of patients with CHI
- Plasma samples for insulin requires rapid and careful handling for reliable results
- There is little published data on the value of plasma C Peptide in the diagnosis of CHI

## OBJECTIVE

To assess the usefulness of plasma c peptide in the diagnosis of CHI

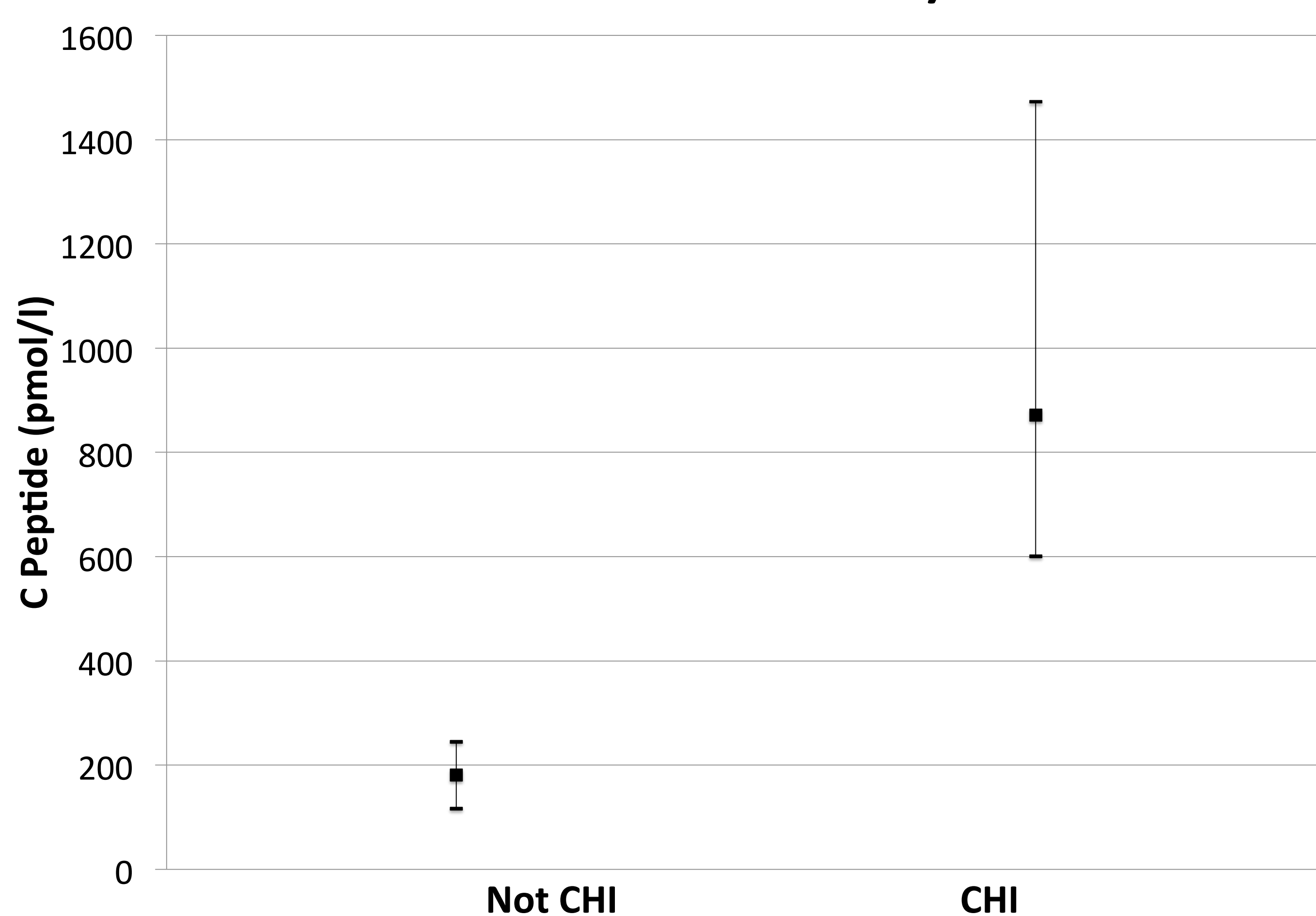
## METHOD

- All completed hypoglycaemia (laboratory glucose  $<2.6$  mmol/l) screening tests undertaken at a tertiary referral centre over a 4 year period were assessed retrospectively
- The diagnosis of CHI was made on a combination of glucose requirement  $>8$ mg/kg/min, detectable insulin during hypoglycaemia, suppressed ketones and a glycaemic response to glucagon
- The plasma C peptide concentration during hypoglycaemia in patients with CHI was compared with that of the patients with other diagnoses (including peroxisomal disorders, respiratory chain disorders, growth hormone deficiency and ketotic hypoglycaemia).

## RESULTS

- 60 results were available from 41 patients.
- Median age was 16 months (1day – 20.5 years). Diagnoses included 23 CHI, 1 growth hormone deficiency, 1 peroxisomal disorder, 1 respiratory chain disorder and 15 ketotic hypoglycaemia.
- The concentration of plasma C peptide in patients with CHI was significantly higher than that for patients with a diagnosis other than CHI as shown in Fig 1( $p<0.001$ ).
- The positive predictive value for a diagnosis of CHI with C peptide concentration of 350 pmol/l is 96.7%.
- The negative predictive value is 80%.

**Figure 1. Graph showing C Peptide vs. diagnosis (Error bars show 95% confidence intervals)**



## CONCLUSION

A plasma C peptide concentration of  $> 350$  pmol/l during hypoglycaemia could be used to differentiate CHI from other causes of hypoglycaemia especially when plasma insulin level is low or could not be obtained.

## REFERENCE

1. Hyperinsulinaemic Hypoglycaemia: Genetic Mechanisms, Diagnosis and Management; Zainaba Mohamed, Ved Bhushan Arya, and Khalid Hussain. Journal of Clinical Research in Paediatric Endocrinology. Dec 2012; 4(4)169