The role for autocrine regulation of IGF-1 in pregnancy related obesity, a potential biomarker for weight loss

[1]Jian Guan, [1]Karen Liu, [2]Gagan Singh Mallah, [3]Lesley McCowan,[4]John Thompson, [4]Ed Mitchell, [3]Rennae Taylor, [5]Paul Harris, [5]Margaret Brimble, [2]Eric Thorstensen and [6]Rinki Murphy

[1]The Department of Pharmacology and Clinical Pharmacology, [2]Liggins Institute, [3]Department of O&G, [4]Department of Paediatrics,[5]Department of Medicinal Chemistry, [6]Department of Medicine, University of Auckland, New Zealand

OBJECTIVES

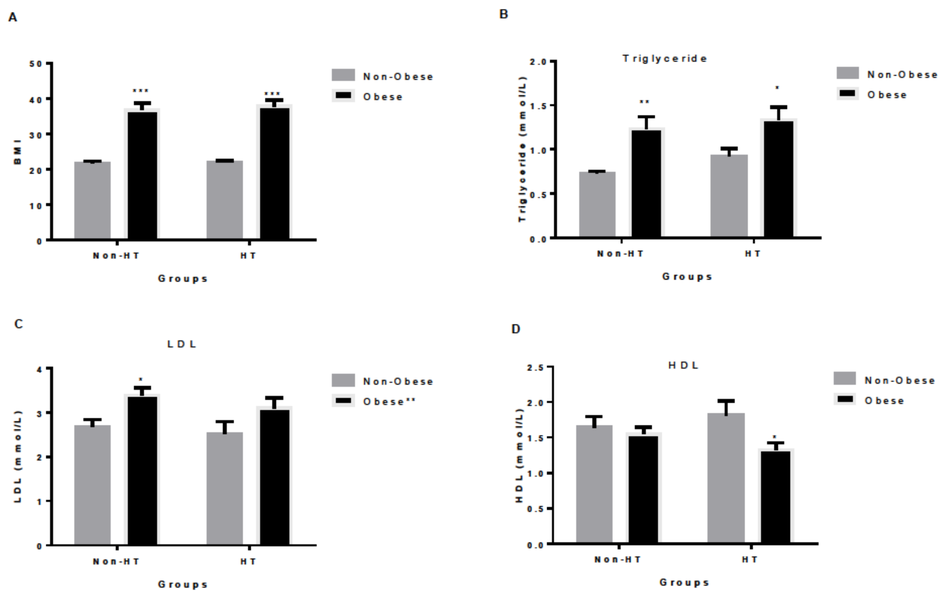
Impaired insulin-like growth factor-1(IGF-1) function associates with obesity and hypertension with weak correlation to circulating IGF-1. As a metabolite of IGF-1, the ratio of cyclic Glycine-Proline (cGP)/IGF-1 regulates IGF-1 bioavailability. We evaluated its association with obesity and/or hypertension and the changes of obesity status between early pregnancy and post-partum.

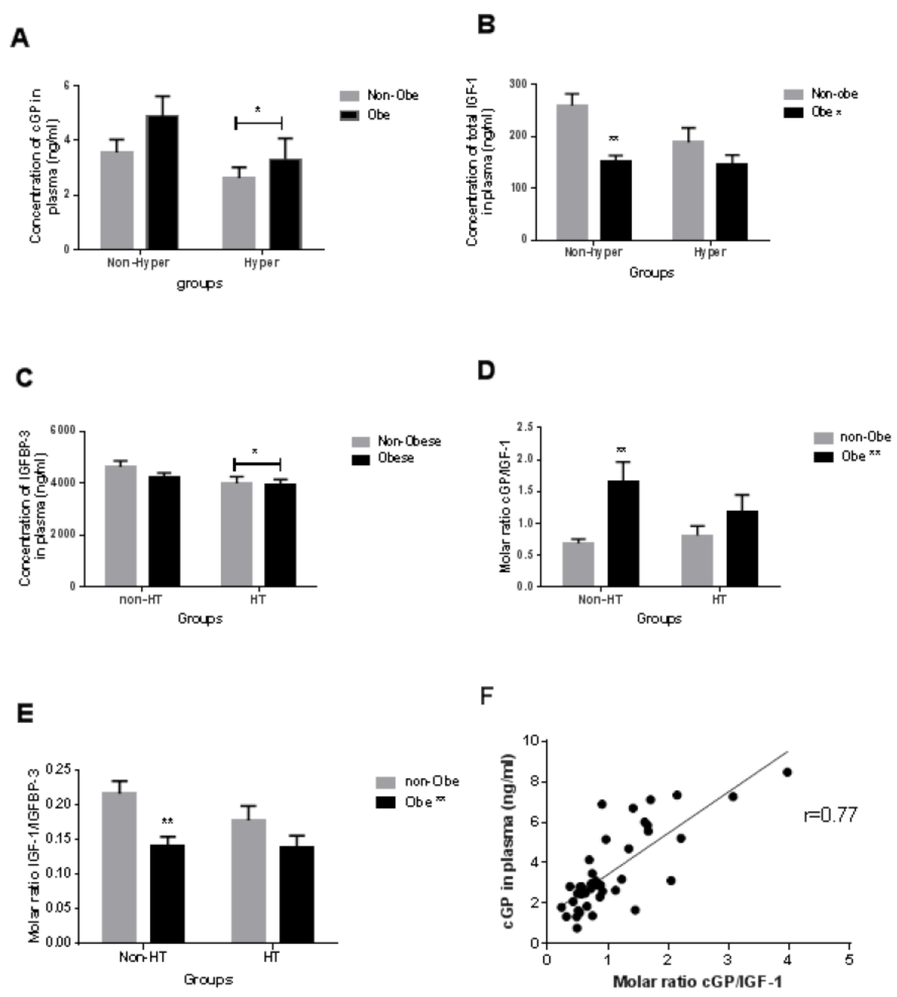
METHODS

We compared plasma concentration of IGF-1, cGP and IGF binding-protein (IGFBP)-3 in the women with obesity and/or hypertension to normal controls. We then compared the differences of these parameters between 15weeks gestation and 6years post-partum in women who were either remained to be normal, or become obese or recovered from obese or remained to be obese at 6years post-partum. cGP was measured using HPLC-ms and IGF-1 and IGFBP-3 were measured using ILESA.

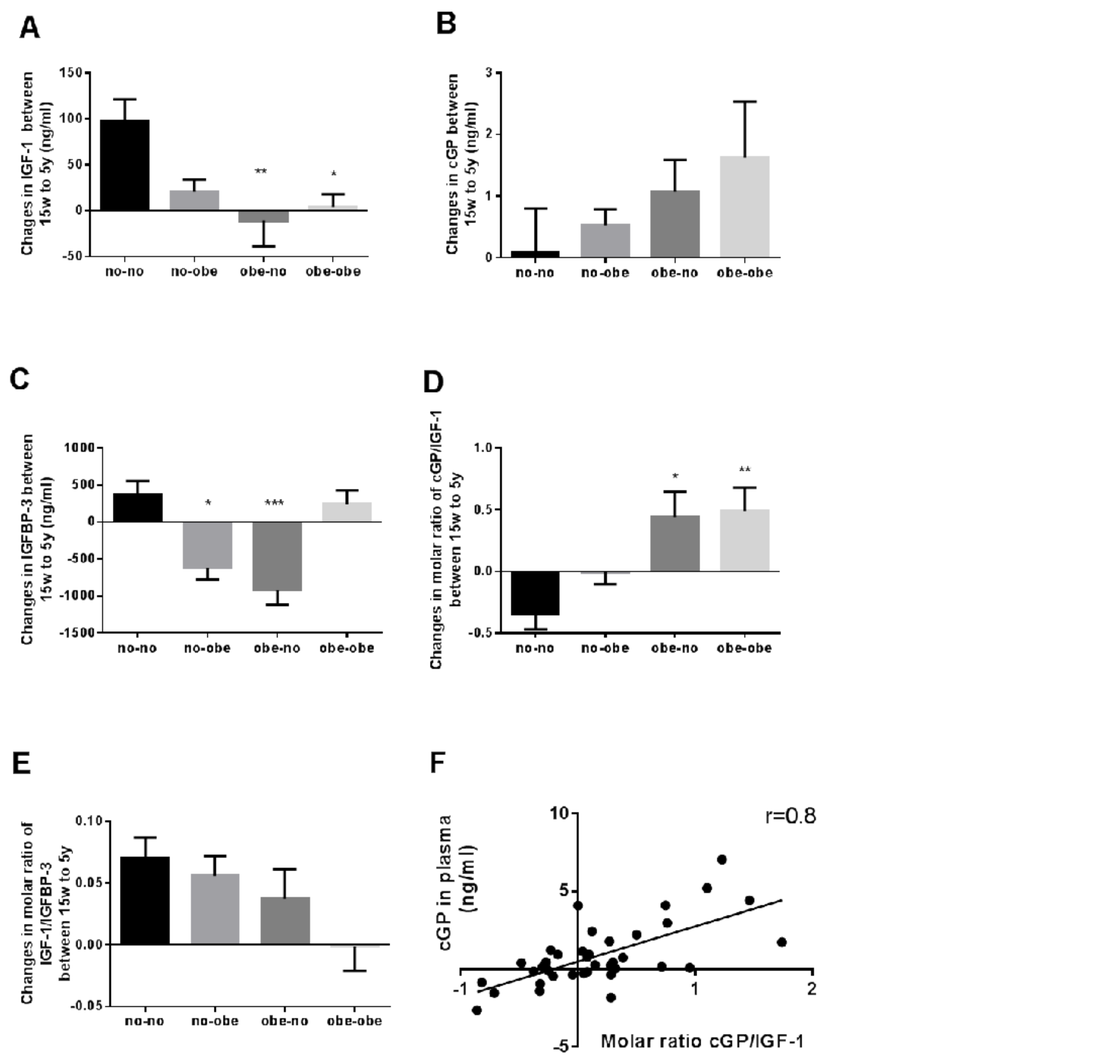
RESULTS

Changes in Obesity and hypertension





Changes between 15 week of pregnancy and 6 year of post partum



In general we found an increase of cGP/IGF-1 ratio in pregnancy related obesity, but not hypertension, possible a specific autocrine response to low circulating IGF-1 in obesity. As a compensatory response to low circulating IGF-1 both reduction of IGFBP-3 and increase of cGP/IGF-1 ratio were essential for the weight loss after pregnancy, possibly mediated through autocrine regulation to improve bioavailability of IGF-1. Thus integrative interpretation of cGP/IGF-1 ratio and IGFBP-3 would be more relevant biomarker for predicting IGF-1 bioavailability.

CONCLUSIONS

cGP/IGF-1 ratio may be associated with obesity. The autocrine regulation with collective responses of reduced IGFBP-3 and increased cGP/IGF-1 ratio may play a role in weight loss.

References

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