

Intranasal insulin increases postprandial thermogenesis in obese women with PCOS



THE UNIVERSITY
of EDINBURGH



Riada McCredie^{1,3}, Yuan Wang^{1,3}, Michael T. Rae², W. Colin Duncan¹, Katarzyna J. Siemienowicz²

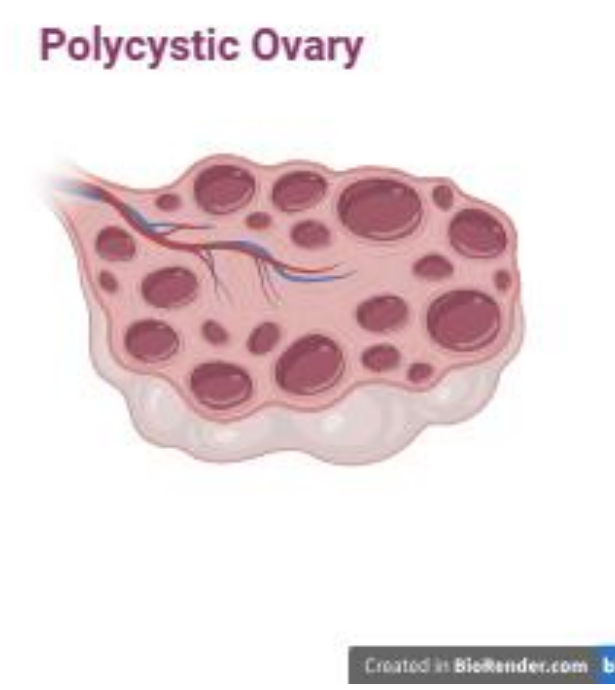
1.Centre for Reproductive Health, Institute for Regeneration and Repair, The University of Edinburgh, UK

2.School of Applied Sciences, Edinburgh Napier University, Edinburgh, UK

3.These authors contributed equally

Objective

Polycystic ovary syndrome (PCOS) is a lifelong condition associated with reproductive and metabolic consequences.



Women with PCOS have a reduced adaptive thermogenesis response to food meaning they don't burn off as many calories after eating. Previous studies conducted in a clinically realistic large animal (ovine) model highlighted that this is due to a centrally-regulated defect in subcutaneous adipose tissue function. These studies have also suggested intranasal insulin (INI) as a novel therapeutic strategy with the hypothesis that it could help obese women with PCOS to regulate their metabolism and lose weight.

Design

This research was conducted as part of a single site basic experimental study called 'INNOCENT' looking at the effect of INI on postprandial energy expenditure (PTEE) in obese women with and without PCOS.



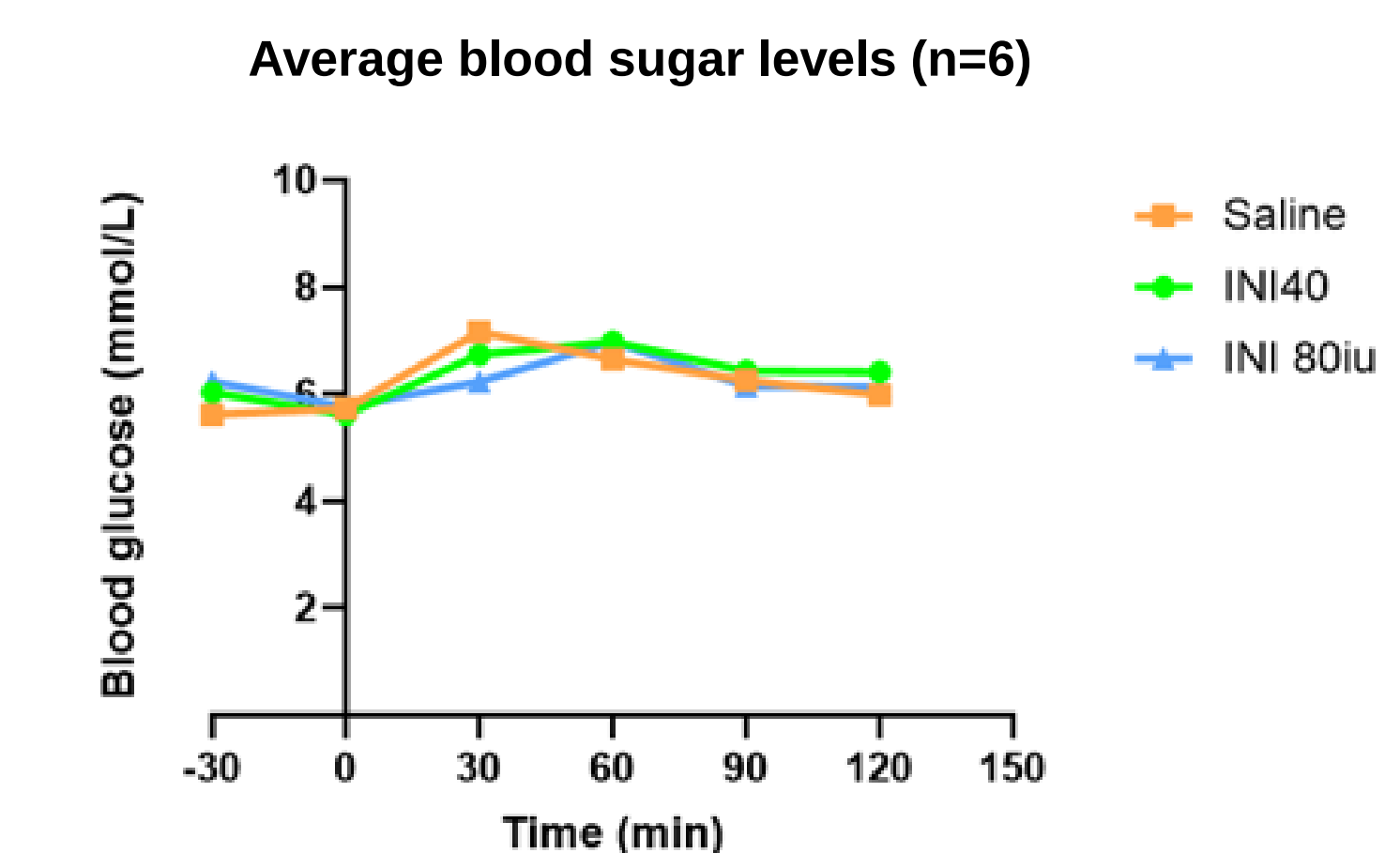
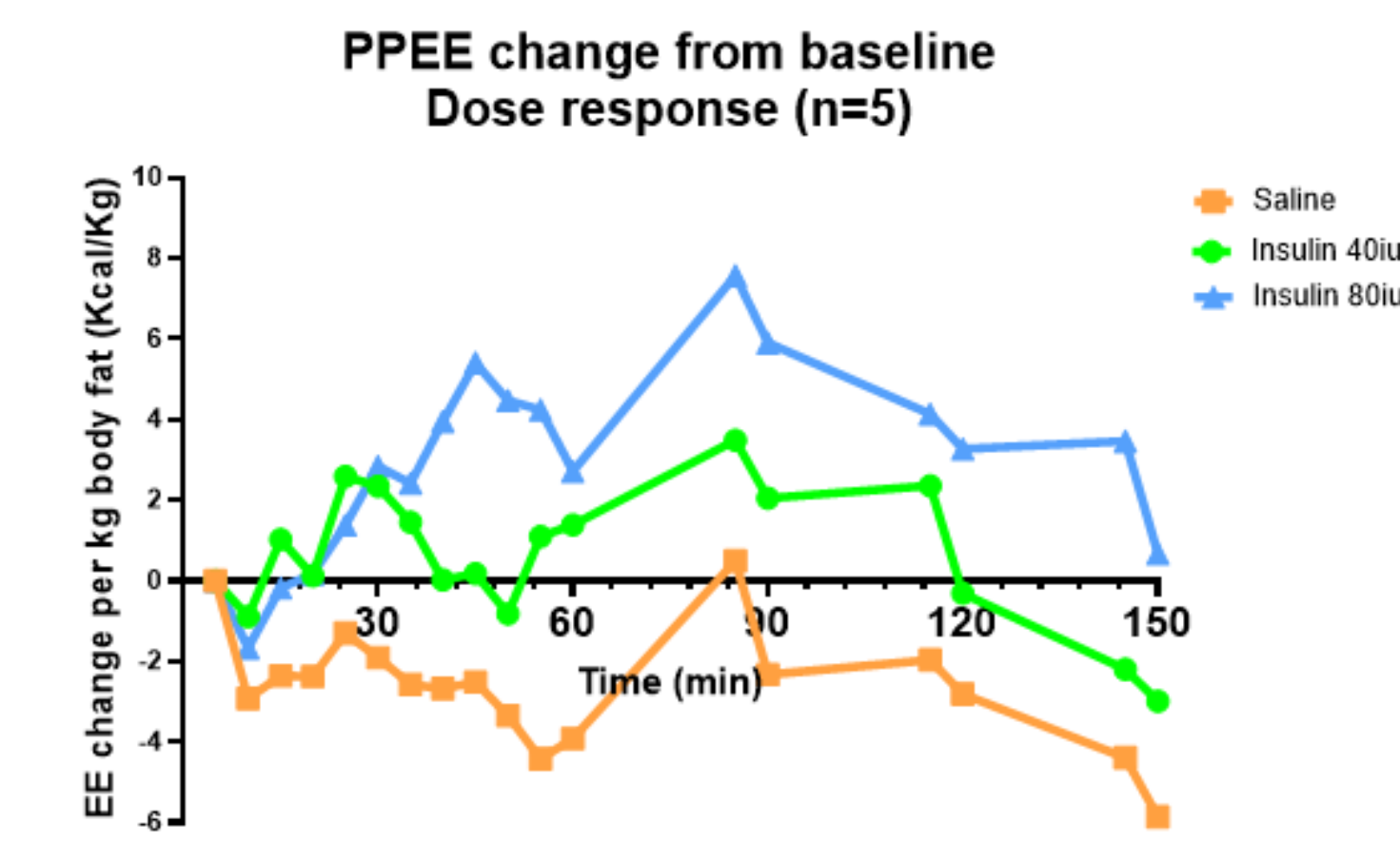
Methods

Eleven obese (BMI >30) women with PCOS, and eleven obese controls were fed a standard liquid meal on two occasions with either intranasal saline placebo or 40iu INI in a random and blinded manner.

A subset of 5 of these PCOS patients also underwent a third linked visit with 80iu INI to determine if there was a dose-response. The effect of INI on PTEE was assessed by indirect calorimetry. GraphPad was used to perform statistical analysis by calculating the area under the curve (AUC) and using t-tests.

Results

With 40iu INI participants with PCOS had significantly greater postprandial energy expenditure than with saline placebo, measured as a change in PTEE from baseline per kg of body fat ($P < 0.05$). Within the subset group ($n=5$) 80iu INI also caused a significant increase in PTEE vs saline placebo ($P < 0.01$). There was a dose-response with 80iu INI (AUC 1972 ± 94) increasing PTEE more than 40iu INI (AUC 1580 ± 166) ($n=5$, $P < 0.05$). There were no adverse effects on blood glucose concentrations.



Conclusion

These results suggest proof of concept and provide additional safety data for INI. There is still an unmet clinical need for accessible and cost-effective weight management treatment for patients with PCOS and this strategy warrants further investigation with proof of efficacy studies.



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