INCREASED BMI DOES NOT ADVERSELY AFFECT VASCULAR FUNCTION MEASURED IN VITRO IN OBESE PATIENTS

Hye-Chung Kwak¹, Mike Larvin¹,², Saoirse O'Sullivan¹

¹School of Graduate Entry Medicine, Royal Derby Hospitals, division of surgery, DE22 3NE, United Kingdom, ²Trent REgional Bariatric Surgical Service, Derby hospitals, DE22 3DT, United Kingdom

Introduction:

Literature suggests that increasing adiposity is associated with diminished vasodilator and increased vasoconstrictor responses (measured non-invasively). It has not yet been established what the contribution of co-morbidities (such as diabetes and hypertension) is on vascular function in obesity. Therefore, the aim of this study was to establish which patient characteristics correlate with vascular function measured in vitro in obese human subjects.

Methods:

The study was approved by Derbyshire Research Ethics Committee. Human omental arteries were dissected from specimens removedatraumatically from consenting bariatric and laparoscopic cholecystectomy patients. Vessel rings were mounted on a myograph (Danish Myo Technology, Aarhus) and recorded using Labchart (AD Instruments Ltd, Oxford). Cumulative concentration-response curves were obtained to endothelin, noradrenaline and U46619 (vasoconstrictors); acetylcholine, bradykinin (endothelium-dependent vasodilators), sodium nitroprusside and prostacyclin (endothelium-independent vasodilators) and correlated to various patient characteristics (skin fold thickness, fasting glucose, insulin, HOMA-IR, high density lipoprotein (HDL), cholesterol:HDL, HbA1c).

Results:

Insulin and increasing HOMA-IR were positively correlated with enhanced relaxation to acetylcholine (p<0.05, prism stats package), bradykinin (p<0.01) and sodium nitroprusside (p<0.05), but not prostacyclin. Acetylcholine was positively correlated with increasing calculated beta cell function (p<0.05) and bradykinin was negatively correlated with calculated insulin sensitivity (p<0.01) HbA1c was positively correlated with contractile responses to vasoconstrictors except to U46619, which was positively correlated with HDL levels and increasing body mass index (BMI).

Conclusions:

There is no consistent relationship between in vitro vascular function and several markers of metabolic and cardiovascular function, but insulin and HbA1c levels appear to affect some vasoactive agents. Contrary to published literature, we have not found that an increase in BMI or markers of adiposity adversely affect vascular function.