Obesity now: what you need to know

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ABSTRACT At no time in human history has the issue of obesity and its health implications been greater. At the same time as disease processes and co-morbidities have become increasingly complex and potential treatments more sophisticated, the additional challenge of increasing numbers of critically overweight patients has arisen. Bariatric assessment and therapeutics are becoming more important. This programme was devised to cover the key areas from the genetics and demographics through the management of clinical situations where obesity is co-existent to the treatment options for obesity itself.

KEYWORDS Bariatric surgery, clinical decision-making, genetics of obesity, obesity, obesity bias, obstetrics

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Obesity is an epidemic affecting all medical specialties. Over the past 50 years there has been a huge increase in the percentage of the population who are classed as obese. This has significant health implications for the individual, and for the nation's health expenditure.

SESSION 1 THE SIZE OF THE PROBLEM

Shona Robison (Minister for Public Health and Sport, Scottish Government) highlighted some alarming statistics, placing Scotland second in the Organisation for Economic Co-operation and Development (OECD) nations with the highest rate of obesity, exceeded only by the United States.[1] Twenty-two per cent of males and 24% of females in Scotland are obese and obesity is thought to be the main contributor to 30% of patients with cardiovascular disease and 50% of cases of type 2 diabetes.[2] Between 1995 and 2003 there was a 50% increase in the number of people who are obese. Estimates contained within the UK Foresight report suggest that by 2050 the cost of obesity to the UK economy could be £50 billion, with Scotland facing a bill of £5 billion. The minister was able to announce £56 million of new funding for the healthy eating action plan over a three-year period and a pathfinder programme, where eight communities across Scotland would receive funding to promote health and encourage these communities to reverse the trend of obesity.

Professor Tim Frayling (Professor of Human Genetics, Genetics of Complex Traits, Peninsula College of Medicine and Dentistry, Exeter) gave a fascinating lecture highlighting his team's work in enhancing our understanding of the genetic variation involved in obesity and related metabolic traits such as type 2 diabetes, coronary heart disease, blood pressure and lipid levels.[3–5] The individual effect of these genetic variants is small, but combined they have much larger effects in increasing risk.

Professor Mark Bellamy (Professor of Critical Care and Anaesthesia, St James' Hospital, Leeds) described how he and his colleagues set up a regional service for the surgical management of morbid obesity. He highlighted the role of the multidisciplinary team, including different medical specialties and allied health professionals in the pre-, peri- and post-operative management of these patients. His service has survived through significant changes in both the political and economic climate and has been the model on which many others have been based.

SESSION 2 DEVELOPING THEMES

Professor Jane Norman (Chair of Maternal and Fetal Health, University of Edinburgh) gave us an insight into the problems posed, and faced, by the obese patient during pregnancy and labour. Obesity in pregnancy is defined as a body mass index (BMI) of greater than 30 kg/m^2 and, according to various sources, the prevalence ranges from 11–20%, but there are no national statistics available to give us the national perspective. The Confidential Enquiry into MAternal and Child Health (CEMACH) report from 2007 noted that obese pregnant women are overrepresented among women who die in pregnancy, with 50% of women who died having a BMI of greater than or equal to 25 kg/m^2 and 27% who died having a BMI of greater than or equal to 30 kg/m^2.[6] According to the UK Obstetric Surveillance System one in 1,000 pregnant females have a BMI greater than 50.

Professor Norman showed evidence of increased incidence of adverse outcomes for both the obese mother-to-be and for the baby, including spontaneous first-trimester miscarriage, gestational diabetes, pre-eclampsia and thromboembolism. The visualisation of fetal anomalies on ultrasound scanning (USS), palpation of the developing fetus and measurement of blood pressure are more challenging in obese patients. The risk of Caesarean section and postpartum haemorrhage increase, possibly

secondary to a direct inhibitory effect on myometrial contractility. Surgery and assisted delivery are more technically difficult in the obese patient and there are significant problems faced by anaesthetists in siting regional anaesthesia and providing general anaesthesia. The risk of asthma and obesity developing in later life for the baby is increased. Professor Norman has set up a metabolic antenatal clinic in Edinburgh, where pregnant patients with a BMI of greater than or equal to 40 kg/m^2 are assessed and managed by a multidisciplinary team.

The Stanley Davidson Lecture was given by Professor Pat Croskerry (Professor of Emergency Medicine, Dalhousie University, Halifax, Nova Scotia, Canada) Professor Croskerry has a particular interest in clinical decision-making and has transferred many decision-making principles from cognitive psychology into the clinical domain. Decision-making is an integral component of being a doctor and yet this has never been an area that has been taught to medical students or junior doctors. Professor Croskerry was involved in organizing the inaugural conference on diagnostic error in Phoenix, Arizona in 2008.[7] He explained the dual process theory of decision; with type 1 being intuitive, reflexive and subject to error and type 2 being analytical, highly reliable and less prone to error. Type 2 decision-making tends to be employed by more senior clinicians, whereas more junior doctors may operate within type 1 due to their lack of clinical experience.

Professor Croskerry then introduced the concept of fundamental attribution error: the tendency to be judgmental and blame patients for their illnesses rather than examine the circumstances that might have been responsible for, in this context, obesity. He then showed data from a 2003 American Academy of Family Physicians survey which showed that more than 50% of physicians described obese patients as non-compliant, ugly, awkward and unattractive and that the heavier the patient, the more negative the attitude towards them. Nurses viewed obese patients as noncompliant, overindulgent, lazy and unsuccessful. In one study, 31% 'would prefer not to care for obese patients' and 12% 'would prefer not to even touch an obese patient'.[8,9] These findings are from surveys carried out in North America but there is no reason not to think that such beliefs are held here too. These biases lead to a negative affect towards obese patients resulting in less time being spent caring for them.

SESSION 3 LIVE INTERACTIVE SIMULATED CLINICAL CASE

We had the opportunity to experience the utility and diversity of simulation firsthand with a live demonstration of the case of Tam McBride, an obese man with type 2 respiratory failure and multiple organ dysfunction presenting acutely unwell to the emergency department. Professor Croskerry then gave a run-down of the clinical decision-making processes employed during the assessment and management of this critically ill patient. It was interesting to note that disparaging comments about a patient or their illness can impact negatively on the clinical decision-making process and the performance of a team.

SESSION 4 CLINICAL CHALLENGES IN THE OBESE PATIENT

Dr David Cameron (Consultant in Anaesthesia and Intensive Care Medicine, Royal Infirmary of Edinburgh) spoke of the challenges in caring for obese patients undergoing anaesthesia and admission to intensive care. The Australian Incident Monitoring Study (AIMS) found that obesity accounted for most cases of difficult intubation. Patients with morbid obesity have a reduced life expectancy and they only have a one in seven chance of a 'normal life'. Obesity has significant adverse effects on all body systems and Dr Cameron gave the analogy of a lawnmower engine attempting to power a tank to explain the additional stress placed on the cardiovascular system. The importance of appropriate patient positioning, with elevation of the head and shoulders so that the ear is in a horizontal line with the sternum, at induction of anaesthesia was emphasised to give the anaesthetist the highest chance of success at the first attempt at intubation. Adequate pre-oxygenation was deemed mandatory to avoid precipitous oxygen desaturation, not due to increased oxygen consumption but due to the weight of the chest and the upward pressure from the abdominal organs on the diaphragm reducing the oxygen reserves in the lung. A specialised team of healthcare workers experienced in caring for obese patients and equipment of appropriate size, e.g. beds, theatre trolleys and blood pressure cuffs, are essential.

Professor Iain Broom (Professor of Clinical Biochemistry, Robert Gordon University, and Professor of Metabolic Medicine, University of Aberdeen) introduced us to a new human species, homo-adipatus, which has developed over the past 50 years. He stated that 'humans are endowed with an ancient physiology moulded by famine and ill-equipped to handle our modern "toxic" environment' with an abundance of highly calorific convenience food and drink. Interestingly, the surge in childhood obesity correlates well with the introduction of home computer systems in the 1990s. Professor Broom explained the obesity therapy options that he has employed during his career. His first line of treatment is a combination of diet and lifestyle modifications with cognitive behavioural therapy. Drugs and surgery were only considered after trialling the less invasive measures first. This was felt to be the most effective means of treatment. Unfortunately serial dieters, who are on and off diets, tend to gain weight at a rate of 1 kg/year due to a hypothalamic drive to gain weight during periods of weight loss. It has been found that a patient needs to

maintain their weight loss for two years in order to 'reset' the hypothalamus.

Mr Duff Bruce (Consultant Surgeon and Chairman of the Severe and Complex Obesity Treatment Service [SCOTS], Aberdeen Royal Infirmary) then discussed bariatric surgical options. Morbidly obese patients with a BMI of >45 kg/m^2 are likely to lose between seven and 13 years of their predicted lifespan as a result of their obesity.[10] The cost of treating obesity-related disease in Scotland alone is estimated at £171 million.[11] Bariatric surgical options include intra-gastric balloon insertion, gastric banding, gastric bypass and sleeve gastrectomy. Whichever surgical option is chosen, the results are impressive: 25–32% weight loss maintained in the long term,[12] 62% weight loss and a resolution or improvement in sleep apnoea symptoms, diabetic control, hypertension and hypercholesterolaemia in most patients.[13]

In Scotland, in 2007 only three bariatric procedures were performed per 100,000 members of the population.[14] It is predicted that there are 100,000 patients who could benefit from bariatric surgery and the current rate of 300 procedures per year is insufficient for this increasing problem. If we were to match the United States in terms of the percentage of morbidly obese patients receiving bariatric surgery, 2,300 procedures would need to be performed per year. Significant investment would need to be made in training, staffing and time resource to meet this demand. Hence the importance of the SCOTS initiative, 'aiming to work with all relevant stakeholders to identify and overcome the gaps in the provision of effective treatment for severe obesity and its associated conditions'.

CONCLUSION

This symposium demonstrated clearly the problems associated with an increasing prevalence of obesity. We were informed of the problems in caring for obese patients in obstetrics and while undergoing anaesthesia and learned about the bariatric surgical options available. Surgery appears to offer significant promise in the management of obesity where medical management has failed or in the morbidly obese. This results in significant, sustained weight loss and improvement in many obesity related conditions. To meet the demand, a significant investment of time, energy and financial resources will be required to establish such a service across Scotland.

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