

WORLD OBESITY

HOT TOP!C CONFERENCE:

Obesity & Pregnancy 2015

COURSE GUIDE





Roland
Devlieger



Dilys
Freeman

Dear Colleagues,

On behalf of the World Obesity Federation (formerly IASO) we are delighted to welcome you to our Hot Topic Conference: Obesity & Pregnancy 2015.

The rise of obesity in developed countries, including amongst women of reproductive age, means that discussing obesity's impact on pregnancy could not be more important.

This two-day event follows on from our previous meeting held jointly with The Obesity Society in Boston, May 2013 and aims to balance basic science, translational research and clinical practice. The current meeting will pick up on the themes raised and research gaps identified in Boston. Topics such as the merit of obesity interventions during pregnancy will be discussed, and we will hear about new policy regarding pregnancy. We will delve into the often poorly-understood factors affecting pregnancy, including gut microbiota, micro-nutrients and physical activity. Our international panel of renowned experts will present their research and integrate their findings on these diverse topics to provide a better understanding of obesity and pregnancy.

We have brought together a faculty of internationally recognised experts in different areas of obesity and pregnancy. We have created an environment in which you can engage with experts and colleagues and take home knowledge that will transform your research, practice and patient outcomes.

We hope that you enjoy the programme and the opportunity to network with your colleagues, meet new friends and the faculty.

Roland Devlieger and Dilys Freeman
Scientific Co-Chairs

Sponsor & Exhibitor Profiles	2
Conference Schedule	4
Speaker Biographies	7
Speaker Abstracts	11
Oral Presentation Abstracts	16
Poster Presentation Abstracts	22

Useful Information

Wifi Details

Username: CDH

Password: time2work

Professional Development

Attendance Provides 4 SCOPE Points and 16 CPD points.



EXHIBITORS

EXHIBITOR

Dairy Council



Address:

210 High Holborn, London,
WC1V 7EP, UK

www.milk.co.uk

Contact:

e.hocking@dairycouncil.org.uk

The Dairy Council is a non-profit organisation with a remit to provide evidence-based information on nutrition, milk, dairy foods and health to a range of stakeholders including consumers, healthcare professionals, the food industry and media. The Dairy Council is staffed by registered dietitians and registered nutritionists and all material published for consumers is accredited with the Information Standard awarded by the Royal Society of Public Health. More information can be found at www.milk.co.uk.

EXHIBITOR

Diploma MSc



Address:

Unit 9, Cardiff Medicentre, Heath
Park, Cardiff, Wales, UK

www.diploma-msc.com

Contact:

info@diploma-msc.com

Diploma MSc offers flexible one year, online, part-time Postgraduate Diploma and MSc courses in Diabetes, Endocrinology, Sports and Exercise Medicine Preventative Cardiovascular Medicine and Obesity and Weight Management in Partnership with the University of South Wales, UK. Based on a highly successful online formula Diploma MSc has seen over 500 students from all over the world qualify over the last five years.

EXHIBITOR

Early Life Nutrition Network



Address:

SHM Productions, 20/22 Bedford Row,
1st Floor, London, WC1R 4EB, UK
earlylifenutritionnetwork.com

Contact:

victoria@shm-ltd.co.uk

The Early Life Nutrition Network, a registered charity, was established to enable members to debate and share knowledge on how to improve behaviours surrounding nutrition in early life. We connect academics and practitioners from around the world and across disciplines, both virtually and face-to-face, bringing together a global community of experts to tackle myths surrounding early life nutrition and change behaviours for the better.

EXHIBITORS

EXHIBITOR

Slimming World



Address:

Clover Nook Road, Somercotes,
Alfreton, Derbyshire DE55 4RF, UK

www.slimmingworld.co.uk

Contact:

Jenny.barber@slimmingworld.co.uk

Slimming World is the most advanced weight management organisation in the UK. Established in 1969 we hold 13,000 weekly groups across the UK run by a network of 4,000 trained consultants working in their local communities. Each year we influence over 3 million people to eat more healthily and adopt a healthier, more active lifestyle. As an RCM Alliance partner we are working closely with the RCM to help to support pregnant women and breastfeeding mothers in managing their weight. We provide healthy lifestyle support to pregnant women and breastfeeding mothers with the aim of preventing excess weight gain.

EXHIBITOR

World Obesity



Address:

World Obesity Federation, Charles
Darwin 2, 107 Gray's Inn Road,
London, WC1 X8TZ

www.worldobesity.org

Contact:

Natasha Joyner
enquiries@worldobesity.org

World Obesity Federation represents professional members of the scientific, medical and research communities from over 50 regional and national obesity associations. Through our membership we create a global community of organisations dedicated to solving the problems of obesity.

Our mission is to lead and drive global efforts to reduce, prevent and treat obesity. We collate, conduct and disseminate world-leading research into obesity, its impact, causes, treatment and prevention. We influence policy of academics, government and business at global, regional and national levels. We bring rigour, consistency and credibility to the field through educational programmes, practical training, publications, conferences and accreditation.

World Obesity offers an internationally recognised online obesity education programme for health professionals, providing evidence-based content developed by leading obesity experts.

SCIENTIFIC PROGRAMME

Thursday 29th October

AM	Start Time
Registration	08:15
Welcome Session <i>Roland Devlieger</i>	09:00
1. Introduction: What are the big questions? <i>Patrick Catalano</i>	09:15
2. Life style interventions during pregnancy: Which ones are really effective? <i>Lucilla Poston</i>	10:30
Coffee Break	11:15
3. DHA, an essential fatty acid required for neurodevelopment, metabolism in healthy pregnancy and preeclampsia <i>Dilys Freeman</i>	11:45
PM	
Lunch	12:30
4. Oral Sessions	13:30
5. Human adipose tissue function – lessons for pregnancy? <i>Peter Arner</i>	14:30
Coffee Break	15:15
6. SmartMoms™: a novel smartphone intervention <i>Leanne Redman</i>	15:45
7. The inter-pregnancy period, an opportunity for intervention? <i>Annick Bogaerts</i>	16:30
Poster Review Session and Networking Reception	17:30–19:00

SCIENTIFIC PROGRAMME

Friday 30th October

AM	Start Time
Registration	08:30
Welcome Session <i>Roland Devlieger</i>	09:00
8. Probiotics/risk of GDM <i>Helen Barrett</i>	09:15
9. Metabolic disorders of pregnancy: gestational diabetes, hyperlipidaemia <i>Nancy Butte</i>	10:30
Coffee Break	11:15
10. Are there gestational effects of maternal body size on the body size of their children that goes beyond the genetic transmission <i>Thorkild Sorenson</i>	11:45
PM	
Lunch	12:30
11. Oral Sessions	13:30
12. What is the utility of micro-nutrients in Pregnancy? <i>David Simmons</i>	14:30
Coffee Break	15:15
13. Policy and Prevention – New Pregnancy Guidelines <i>Nathali Schumann</i>	15:45
14. Wrap up & Take Aways <i>Dilys Freeman/ Roland Devlieger</i>	16:30
Finish	17:30

SCIENTIFIC COMMITTEE & ABSTRACT REVIEWERS

Dilys Freeman (Co-Chair)	Roland Devlieger (Co-Chair)	Nancy Butte	Patrick Catalano
University of Glasgow, UK	UZ Leuven, Belgium	Baylor College of Medicine, USA	Case Western Reserve University, USA

WORLD OBESITY

WHAT WE DO

/ MEMBERSHIP

- / 53 member associations
- / Representing 56 countries
- / Discounted publications
- / Discounted event registration
- / Access to prevalence data and research support
- / Discounted registration for Specialist Certificate of Obesity Professional Education (SCOPE)
- / Briefings and advocacy support

/ INTERNATIONAL CONGRESS & MEETINGS

- / International Congress on Obesity (ICO)
- / SCOPE Schools
- / Hot Topic Conferences
- / STOCK Conferences
- / For more information visit:
www.worldobesity.org/events/

/ JOURNALS & PUBLICATIONS

- / Clinical Obesity
- / Obesity Reviews
- / Pediatric Obesity
- / International Journal of Obesity
- / Reduced subscription fees are available for members

/ RESEARCH & PROJECTS

- / Global centre compiling the latest statistics on obesity prevalence
- / Comprehensive and current data in the form of maps, charts, tables and slides for review and download
- / Research projects on topics such as marketing to children and investigating the benefits of modest weight loss

OUR MISSION IS TO
LEAD AND DRIVE
GLOBAL EFFORTS
TO REDUCE,
PREVENT AND
TREAT OBESITY.

/ SCOPE

- / Internationally acclaimed high-quality education programme aimed at improving the treatment of obese and overweight patients
- / Open to all health professionals
- / Take a course in our new e-learning environment
- / Bite-sized modules, expert lectures and interactive assessments
- / Earn CPD points
- / Keep up to date, visit:
www.worldobesity.org/scope/

/ POLICY & PREVENTION

- / Research-based think tank of international obesity experts
- / Advocacy for effective prevention of obesity at national, regional and global levels
- / Officially collaborating with the World Health Organisation

/ CLINICAL CARE

- / Provision of SCOPE, a high-quality, internationally recognized course to educate health professionals in the management and prevention of obesity
- / Recognise the importance and expertise of healthcare professionals in the field of obesity management through fellowship of SCOPE
- / Develop international consensus statements and management strategies using evidence-based techniques and producing management guidelines for use by healthcare professionals

SPEAKER BIOGRAPHIES



Roland Devlieger

Roland Devlieger, MD, PhD, is the head of the department of Fetal and Maternal Medicine, University Hospitals Leuven and is Associate Professor at the University of Leuven, Belgium. He earned his medical degree, specialty certification and PhD from the University of Leuven, Belgium and completed subspecialty training in maternal and fetal medicine at the University of Leiden, The Netherlands and Dundee, United Kingdom.

Professor Devlieger's main research interests include fetal surgery and fetal infections, maternal obesity and pregnancy after bariatric surgery. He is past President of the Flemish Obstetrical Working Party, vice-president of the Belgian association for the study of Obesity (BASO), Board member of the international society for prenatal diagnosis (ISPD) and is Associate Editor of Acta Obstetrica Gynaecologica Scandinavica and Facts, Views and Vision in Obstetrics and Gynaecology. He (co) authored over 150 peer reviewed publications and book chapters, mainly on the subject of fetal medicine, maternal obesity and pregnancy after bariatric surgery.



Patrick Catalano

Patrick Catalano, M.D. is Professor of Reproductive Biology at Case Western Reserve University. He received his M.D from the University of Vermont. Dr. Catalano's research interests include the longitudinal evaluation of women before and throughout pregnancy to determine the short and long term effects maternal obesity and diabetes on the mother and her fetus. He was the previous Chair of the American Diabetes Association Council on Pregnancy, Co-Chair of the NICHD Scientific Vision Group on Pregnancy and Institute of Medicine (IOM) committee to review the gestational weight gain guidelines. Awards include the Norbert Freinkel, the Jorgen Pedersen, the Agnes Higgins and the Charles Best lectureship.



Leanne Redman

Dr. Leanne M. Redman an experienced clinical researcher with a particular focus on the physiology of body weight regulation in humans. She has more than 10 years of

experience in designing and conducting controlled studies in humans where diet and physical activity are manipulated to alter body energy stores and therefore body weight. Dr. Redman is a native Australian and has spent the past 10 years at Pennington Biomedical Research Center where she is an Associate Professor and directs a highly successful research program in Reproductive Endocrinology and Maternal/Infant Health. She is currently the Principal Investigator of three NIH grants all of which involve comprehensive phenotyping of women including studies in polycystic ovary syndrome, pregnancy and postnatal health. These in-depth studies implement innovative SmartPhone technologies that were invented by Dr. Redman and her colleagues to deliver weight management interventions. Dr. Redman has published more than 80 research papers around energy metabolism, insulin sensitivity, obesity, calorie restriction and exercise.



Lucilla Poston

Biography not submitted.

SPEAKER BIOGRAPHIES



Peter Arner

Peter Arner is professor of medicine at Karolinska Institutet and specialist in endocrinology. He has published more than 400 original articles in human metabolism mainly about obesity and type 2 diabetes. His main focus is human adipose tissue. He is one of the most scientist in the world in obesity research according to Institute for Scientific Information and has received many international awards in diabetes and obesity research



Annick Bogaerts

Annick Bogaerts is lecturer and researcher at University Colleges Leuven-Limburg (UCLL) and doctor assistant at KU Leuven, department development & regeneration and at Faculty of Medicine and Health

Sciences at University of Antwerp, Department of Nursing and Midwifery Sciences, Belgium. Annick worked more than 12 year as a midwife in a regional hospital, has 19 years of experience in teaching and guiding students at UCLL and defended her PhD in biomedical sciences about 'Obesity and pregnancy, an epidemiological and intervention study from a psychosocial perspective' in June 2013 at KU Leuven Belgium and Tilburg university, the Netherlands.

Her main domain of interest is within perinatal epidemiology and health promotion, including perinatal intervention studies focussing on healthy lifestyle, i.e. weight management and psycho-social wellbeing. She is coordinating a telemonitoring project for pregnant women and a follow-up study in children of obese women for anthropometrics and child behaviour and development.



Helen Barrett

Dr Helen Barrett is an Obstetric Physician and Endocrinologist at Royal Brisbane and Women's Hospital, Brisbane and a Clinical Academic in the School of Medicine, The University of

Queensland. She undertook her endocrinology and obstetric medicine training in Sydney and Brisbane and has recently completed her PhD through the School of Medicine at The University of Queensland. Helen has a strong interest in improving the outcomes of complicated pregnancy and her PhD studies focussed on the role of lipids in maternal diabetes and preeclampsia. She is currently involved in the SPRING study, examining the use of probiotic supplementation to prevent GDM.

SPEAKER BIOGRAPHIES



Nancy Butte

Dr. Butte is an internationally recognized expert in energy metabolism, infant and maternal nutrition, and childhood obesity. She holds a doctoral degree in nutritional sciences and master's

degree of public health from the University of California-Berkeley. Dr. Butte has conducted complex, longitudinal studies to define energy requirements of infants, children and adolescents, as well as pregnant and lactating women in the US and Mexico. Throughout her studies, she has employed state-of-the-art methodology to measure energy expenditure, body composition and physical activity. She has co-authored 220 peer-reviewed journal articles and book chapters. Dr. Butte has served as a consultant for US government and international agencies (IOM, NIH, USDA, NCHS, FAO, WHO, USAID, IAEA). Her current research focuses on environmental and genetic factors contributing to obesity in Hispanic children, and the development of a systems approach to the prevention and treatment of childhood obesity. She is the principal investigator of the VIVA LA FAMILIA Study which was designed to identify genetic and environmental factors influencing childhood obesity in the Hispanic population and a CDC Child Obesity Demonstration Project to test a systems approach to child obesity among low-income, ethnically diverse overweight and obese children. In addition, Dr. Butte and her colleagues are currently investigating the energy requirements of women carrying twins using stable isotopes, 3-D fetal imaging and *in vivo* body composition techniques.



Thorkild Sorenson

Born 1945, MD in 1971, Doctoral Degree (Dr. Med. Sci.) in 1983, specialist in internal medicine 1983, and in liver diseases in 1985, department chairman at Hvidovre University

Hospital 1988. Received 1989 a 5-year position as MRC Professor of clinical epidemiology, and was appointed 1994 as clinical professor at the University of Copenhagen, affiliated with the Institute of Public Health at the Faculty of Health Sciences, and as chief physician in clinical epidemiology at the Copenhagen Hospital Corporation. Since 1993, Director of the hospital-based Institute of Preventive Medicine. Dean of the Faculty in 1995-96. By 2011, half-time Professor of metabolic epidemiology at the Novo Nordisk Foundation Centre for Basic Metabolic Research, associated with the Section on Metabolic Genetics. Main domains of research the last decades have been various aspects of obesity, addressed by methods in clinical, genetic and general epidemiology. Coordinator of several national and international research programs and networks, advisor, supervisor or reviewer of multiple doctoral and PhD dissertations, served as scientific advisor or reviewer for many different national and international institutions, organisations, large-scale projects, and journals. Published 514 original papers, 95 review papers, and 29 editorials. President of The Danish Association for the Study of Obesity in two full term periods, and President of the European Congress on Obesity in Copenhagen, 1995. Received the Hagedorn, the Codan and the Erhoff prizes, and the Population Science and Public Health Award from the International Association for the Study of Obesity. Knight of the Order of Dannebrog in 2008, and Doctor Honoris Causa at the University of Helsinki in 2010 and the University of Southern Denmark in 2011. Honorary Visiting Professor at Bristol University, UK since 2011.

SPEAKER BIOGRAPHIES



David Simmons

David is the Professor of Medicine at the University of Western Sydney Macarthur Clinical School, Head of the Campbelltown Hospital Endocrinology Department.

Between 2007-2014, he was the lead diabetes consultant at Cambridge University Hospitals NHS Foundation Trust, 2003-2007 he was the inaugural Professor of Medicine at the University of Auckland Waikato Clinical School and 1998-2002 he was the Foundation Chair in Rural Health at the University of Melbourne. He is a past president of the Australasian Diabetes in Pregnancy society (ADIPS) and was a member of the World Health Organisation technical working group on the criteria for hyperglycaemia in pregnancy. With over 250 publications, he has several national and international awards for his work in diabetes epidemiology, diabetes in pregnancy and diabetes service development.



Nathali Schumann

Ms Schumann is a Public Health Professional with a MSc in Public Health from the London School of Hygiene and Tropical Medicine. She is a consultant providing technical support to the 'Nutrition, Physical

Activity and Obesity Programme' at the Division of Noncommunicable Diseases and Promoting Health through the Life-course at the WHO Regional Office for Europe. Ms Schumann contributed to the WHO Regional Office for Europe published report Good Nutrition: the Best Start in Life (2015).



Dilys Freeman

After studying Biochemistry at the University of Edinburgh, Dr Dilys Freeman undertook her PhD in industry at Glaxo Group Research in Middlesex. Postdoctoral positions in Glasgow and the University of Texas

Southwestern Medical Center at Dallas were followed by her first academic appointment in Biological Science at the University of Durham. Dr Dilys Freeman joined the University of Glasgow in 1999. Dr Freeman's early research was in the field of cardiovascular disease in particular lipid and lipoprotein metabolism. She studied cholesteryl ester transfer protein and its role in high density lipoprotein metabolism as well as the genetic regulation of plasma high density lipoprotein and low density lipoprotein levels. Dilys has been involved in the analysis of the West of Scotland Coronary Prevention Study (WOSCOPS), in particular the influence of inflammation, statins and genetics on the aetiology of type 2 diabetes. Her current research is in the field of metabolism in pregnancy and related complications such as preeclampsia, gestational diabetes mellitus and growth restriction. Again the focus is on lipid and carbohydrate metabolism and inflammation. Of particular interest is the role of adipose tissue function, ectopic fat accumulation and vascular function in the development of adverse pregnancy outcome.

SPEAKER ABSTRACTS

Introduction: What are the big questions?

Patrick Catalano, Case Western Reserve University, USA

Obesity in pregnancy (BMI > 30) affects 1 in 3 women of reproductive age in the United States. The numbers are only slightly less dramatic in many developed countries and are increasing rapidly in developing countries. The medical and economic burdens are staggering and based on the concept of DOHaD, these costs will be with us for generations. The following are some of the questions that I think need to be addressed:

Maternal:

- Is there a best nutritional recommendation in pregnancy for all obese women?
- Are the 2009 IOM gestational weight gain guidelines important and do they need to be revised in light of recent literature?
- Lifestyle interventions during pregnancy, what should be the defined outcomes and how do we determine if the benefits are worth the cost?
- There has been a major focus on energy intake during pregnancy, what is the role if any on energy expenditure?

Neonatal:

- Characterizing fetal growth, is birth weight sufficient?
- Does breastfeeding in obese women have similar benefits for the neonate as breastfeeding in normal weight women?

Other:

What are the basic and translational research studies which need to be performed to better understand the pathophysiology of obesity in pregnancy?

- Human physiology studies
- Animal studies, if so which models
- Epigenetics
- Microbiome/probiotics

Life style interventions during pregnancy: Which ones are really effective?

Lucilla Poston, Kings College London, UK

Abstract not submitted.

SPEAKER ABSTRACTS

Docosahexaenoic acid (DHA), an essential fatty acid required for neurodevelopment, in healthy pregnancy and preeclampsia

Dilys Freeman, University of Glasgow, UK

Maternal gestational hyperlipidaemia is physiological and provides for the energy demands of the fetus as well as supplying lipid precursors necessary for fetal development. The long chain polyunsaturated fatty acid (LC PUFA) docosahexaenoic acid (DHA or 22:6n-3) is important in neurological development as it is a major structural lipid in the brain and is required for the membrane fusion necessary for neurite outgrowth in developing neurons. The growing fetus preferentially acquires DHA via placental transport. In contrast, the essential dietary fatty acids linoleic acid (LA) and alpha-linolenic acid (ALA), which are the precursors of LC PUFA, are at best minimally transferred to the fetus. Previous data has provided evidence of the importance of DHA during the latter stages of pregnancy when the fetal brain accrues its tissue mass. We have shown that fatty acids essential for brain development are mobilised into the maternal circulation by the end of the first trimester and now have evidence that the plasma concentration of DHA increases over the first 45 days of pregnancy. This rapid and early mobilisation of DHA is consistent with our hypothesis that this fatty acid is of critical importance not only in late pregnancy but also early in pregnancy when embryological nervous tissue is beginning to form. In preeclampsia, maternal and fetal plasma concentrations of DHA and other LC PUFA are reduced. There is evidence that in preeclampsia mothers are less able to expand their adipose tissue and their adipocytes are more insulin resistant resulting in increased lipolysis. Excessive lipolysis and reduced capacity to store fatty acids in adipose tissue can lead to ectopic fat accumulation in the liver and other tissues, including the placenta, with downstream pathological consequences resulting from lipotoxicity including inhibition of LC PUFA synthesis.

Human adipose tissue function – lessons for pregnancy?

Peter Arner, Karolinska Institutet, Sweden

It is well known that pregnant women easily catch on excess body fat during pregnancy and have difficulties in losing it after delivery. It is possible that changes in adipose tissue handling of lipids during the weight gain are important for these difficulties in handling adipose tissue properly. Recently we developed methods to study the turnover of human fat cells and their lipid content by studying the incorporation of ^{14}C from the atmosphere into the fat cells. Weight gain, even moderate is accompanied by a decrease in lipid turnover due to increased storage capacity and decreased removal capacity of lipids in the fat cells. In addition weight gain leads to an acceleration of the formation of new fat cells in the body so that a state of hypercellularity develops. Subsequent weight loss, even from morbid obesity to normal weight does not normalize the fat cell number just the size of the fat cells. These changes in fat cells may play an important role in increase and maintenance of large fat stores following pregnancy.

SmartMoms™: a novel smartphone intervention

Leanne Redman, Pennington Biomedical Research Center, USA

Pregnancy is considered a teachable moment yet implementation of an intensive lifestyle intervention alongside an already burdensome prenatal care plan is unrealistic. Given that gestational weight gain (GWG) is associated with childhood obesity and more than two-thirds of pregnant women exceed current guidelines, the need to develop scalable and cost-effective approaches to deliver intensive lifestyle programs in pregnancy is urgent. Fifty-four overweight ($n=25$) and obese ($n=29$) pregnant women were enrolled in this study to test whether an intensive lifestyle program delivered through a smartphone (SmartMoms-Phone) would be as successful as a traditional in-person program (SmartMoms-Clinic) and would reduce the proportion of women with excess gestational weight gain in comparison to a non-intervention group (Physician Directed-Control). SmartMoms includes use of goal setting and self-monitoring of weight and activity with digital scales and accelerometers against personalized

SPEAKER ABSTRACTS

weight/activity graphs, receipt of SmartTips® weekly in the second trimester and biweekly in the third trimester with personalized feedback from counsellors. Study outcomes were assessed at clinic visits conducted ≤ 13 weeks and between weeks 35-36 of gestation. GWG in the physician directed group was 12.8 ± 1.5 kg and 9.0 ± 0.9 kg in the SmartMoms groups ($p=0.05$). According to the 2009 IOM guidelines, 84.6% of women in the physician directed group had excess GWG in comparison to only 56.8% of women receiving the SmartMoms intervention ($p=0.01$). Intensive lifestyle interventions promoting a healthy GWG according to the 2009 IOM guidelines can be delivered through smartphones to control GWG with a high degree of efficacy and future studies are warranted.

The inter-pregnancy period, an opportunity for intervention?

Annick Bogaerts, University Colleges Leuven-Limburg, Belgium

Maternal obesity and excessive gestational weight gain are both associated with a two- to fourfold increased risk for pregnancy and childbirth complications compared with women with a normal BMI and with those with an adequate gestational weight gain. To get stronger and valid estimates on the causal relation between maternal weight changes and perinatal outcomes, we examined associations between maternal weight changes between the start of the first and the second pregnancy and the risk for adverse perinatal outcomes in a regional representative cohort of women who had their first two consecutive singleton births in Belgium between 2009 and 2011. We show that weight retention between the first and second pregnancy is associated with an increased risk for perinatal complications, even in normal-weight women. Stabilizing interpregnancy weight appears an important target for reducing adverse perinatal outcomes in a second pregnancy. The majority of women do not receive weight loss nor physical activity advice during the postnatal period while most of them reported plans to seek weight loss information. Continuity and support from healthcare providers and lifestyle coaches in the weeks and months after delivery are lacking and can have a significant contribution and influence on a mother's (and father's) lifestyle behaviour including support for returning to pre-gestational maternal weight. Considering the increasing numbers

of maternal obesity worldwide and the low rates of preconception consultations, the inter-pregnancy period can be an interesting window of opportunity for lifestyle coaching. Finding an optimal setting and strategy to help women return to their pre-pregnancy weight is a challenge.

Probiotics/risk of GDM

Helen Barrett, The University of Queensland, Australia

Multiple bacterial species inhabit the human gastrointestinal tract. Variations in the gut microbiome have been associated with abnormal host metabolism, including dyslipidaemia and diabetes mellitus. It is possible that changing the gut microbiome may offer a way to improve host metabolism. This presentation will discuss the evidence for the role of the gut microbiome in influencing human metabolism and the clinical studies of probiotic supplementation in pregnancy.

Metabolic disorders of pregnancy: gestational diabetes, hyperlipidaemia

Nancy Butte, Baylor College of Medicine, USA

Gestational diabetes mellitus (GDM) is defined as glucose intolerance with onset or first recognition during pregnancy. American Congress of Obstetricians and Gynecologists endorses a two-step approach at 24-28 weeks of gestation for screening (50 1-h OGTT) and diagnosis (100 g 3-h OGTT) (ACOG, 2013). ADA (2011) and WHO (2013) endorse the International Association of Diabetes and Pregnancy Study Group one-step approach (75 g, 2-h OGTT) for all women (IADPSG; Metzger 2010). IADPSG criteria doubles the rates of GDM compared to the two-step approach. GDM imports some excess risk of perinatal complications but only a minority of pregnancies will have adverse outcome attributable to GDM. For the mother, there is an increased risk for gestational hypertension, preeclampsia, C-section, and later diabetes mellitus. For the child, there are modest increases in macrosomia, neonatal hypoglycemia, hyperbilirubinemia, operative delivery, shoulder dystocia, birth trauma, and possibly later obesity. Mechanisms underlying GDM β -cell dysfunction include anti-islet antibodies or antibodies, genetic variants, and maternal

SPEAKER ABSTRACTS

obesity and chronic insulin resistance. Carbohydrate and lipid metabolism in normal pregnancy and GDM and hyperlipidemia of pregnancy will be reviewed. Nutritional management remains the cornerstone for treatment of GDM and hyperlipidemia, and when necessary medications. Adherence to dietary and exercise recommendations, medications and avoidance of excessive gestational weight gain have had modest success in reducing risk for GDM, preeclampsia and macrosomia. Interventions targeting maternal obesity and chronic insulin resistance are needed prior to conception to improve neonatal and maternal outcomes. Abnormal lipid metabolism in pregnancy appears associated with adverse pregnancy outcomes; however, further research is needed to address treatments to modify maternal lipids during pregnancy.

Are there gestational effects of maternal body size on the body size of their children that goes beyond the genetic transmission

Thorkild Sørensen, University of Copenhagen, & Institute of Preventive Medicine, Bispebjerg and Frederiksberg Hospitals, Denmark.

The serious health implications of the obesity epidemic among both children and their parents make it very important to target modifiable causes of the epidemic early in life. It has been suggested that the epidemic is geared by specific gestational effects of maternal obesity enhancing the risk of obesity in their children, which leads to the idea that prevention of maternal obesity could be an important target for prevention of development of obesity of their children. Such effects may act on the background of the well-established genetic transmission of the predisposition to obesity. The genetic contribution to individual differences in various measures of adiposity, body mass index (BMI) in particular, is becoming manifest already during infancy. According to twin studies, the heritability (proportion of variance attributable to genetic variance) of body mass index is in the range of 0.4 through 0.8, varying during childhood and adolescence. The remainder of the variance is attributable to either unique individual influences or shared environmental influences, which is particularly important during childhood and may also imply environmental influence shared with the parents and especially with the mother during gestation.

The genetic transmission implies correlations between parental and offspring BMI at around 0.3. The answer to the question about gestational effects of maternal body size on the body size of their children will therefore have to address to what extent are there such specific maternal effects that go beyond the genetic transmission and are sustained from childhood through adulthood? Studies searching for such effects will have to incorporate the genetic effects. This may be done by comparing maternal-child with paternal-child correlations in BMI and by comparing siblings born to mothers who have changed their body weight between the pregnancies. The overall outcome of these analyses is that the sustained specific maternal effects, related to her BMI, if existing, are rather limited, and are unlikely to be a successful approach to combat the epidemic.

What is the utility of micro-nutrients in Pregnancy?

David Simmons, University of Western Sydney

The health and wellbeing of both mother and growing foetus are dependent on an increased supply of both macronutrients and micronutrients during pregnancy. While increased energy demands can be managed in different ways, micronutrients require an increased supply. Inadequate supply of vitamins and minerals can be associated with catastrophic effects (eg neural tube development and folate, cretinism and iodine) and is associated with low birth weight. Long term follow up studies of low birth weight offspring, and babies born during famines, has demonstrated an association between low birth weight and obesity (and eg type 2 diabetes), an association that has been shown to be inter-generational in some cohorts. Both structural and epigenetic mechanisms have been studied to explain these relationships, some of which may be mediated through reduced micronutrient supply including Vitamin B12, zinc and/or magnesium. Another potential mechanism by which reduced micronutrient supply might influence pregnancy is through the development of gestational diabetes (GDM). For example, studies have suggested that myo-inositol supplementation might improve insulin sensitivity with randomised controlled trials (RCTs) of myo-inositol supplementation suggesting reduced GDM development. Another vitamin under active review is Vitamin D, maternal concentrations of which are low in the presence of obesity. RCTs of Vitamin D supplementation

SPEAKER ABSTRACTS

are currently underway to test whether GDM can be prevented. There is no doubt that micronutrients are important during pregnancy, and can be readily supplemented. Further research is needed on their benefits for reducing the short and long term metabolic risks in both mother and baby.

Policy and Prevention – New Pregnancy Guidelines

Nathali Schumann, Consultant of the Programme for Nutrition, Physical Activity and Obesity, WHO Regional Office for Europe, Denmark.

The current epidemics of obesity, diabetes and related non-communicable diseases are of increasing concern for national and international health authorities, with international agreements to arrest and then reduce the prevalence of obesity and diabetes across the globe. Commitments to reduce health inequalities and improve maternal, infant and young child health have been adopted by national governments. These commitments will only be realised through investment in cost-effective and sustainable health promotion measures at the start of the life-course. This includes a range of intersectoral changes, which help to reduce health inequalities and include social and economic policies as well as comprehensive health and nutrition policies and services whilst ensuring equivalent access to support and advice across the socio-economic spectrum.

During 2014 the WHO Regional Office for Europe's Survey of *National Recommendations for Nutrition, Physical Activity and Weight Gain during Pregnancy* was sent to the 53 Member States in the Region. The findings indicate wide variations between Member States in their development of high quality standards and gaps between policy recommendations and their effective implementation.

Based on the survey results, four priorities were identified including the need to: develop and regularly update recommendations for national use; reduce health inequalities throughout the Region through improved maternal and infant nutritional status; ensure capacity building; and support Member States' requests for action. With the WHO-led Commission to End Childhood Obesity it is particularly timely to review current practices and promote policies to improve maternal, infant and young child nutrition across the region.

Wrap up & Take Aways

Dilys Freeman/ Roland Devlieger

The inaugural World Obesity Federation Hot Topic Conference took place in Boston 2013. At that conference Professor Patrick Catalano chaired an excellent session at the end of the conference (which overran because everybody had something to say!) where he summarised where the field was at and the outstanding unanswered questions. Roland Devlieger and I will attempt to do the same at the end of Obesity and Pregnancy 2015 summarising the key clinical and scientific questions addressed during the conference. We will welcome contributions and opinion from the floor.

ORAL PRESENTATION ABSTRACTS

DAY 1

Group Prenatal Care: Intervention Impacts Pregnancy and Postpartum Weight Trajectories

Urania Magriples MD¹, Marcella H. Boynton PhD², Trace S. Kershaw PhD³, Jessica Lewis LMFT³, Sharon Schindler Rising CNM MSN⁴, Jonathan N. Tobin PhD^{5, 6}, Elissa Epel PhD⁷, Jeannette R. Ickovics PhD³

1. Department of Obstetrics and Gynecology, Yale University School of Medicine, New Haven, Connecticut
2. Lineberger Comprehensive Cancer Center, University of North Carolina, Chapel Hill, North Carolina
3. Yale School of Public Health, New Haven, Connecticut
4. Centering Healthcare Institute, Silver Spring, Maryland
5. Clinical Directors Network, New York, New York
6. Albert Einstein College of Medicine of Yeshiva University, Department of Epidemiology and Population Health, Bronx NY
7. University of California, San Francisco, Department of Psychiatry

Objectives: To investigate whether group prenatal care impacts pregnancy weight gain and postpartum weight loss trajectories, and determine whether prenatal depression and distress mediate these trajectories.

Methods: Secondary analysis of a cluster-randomized trial in 14 community health centers and hospitals in New York City. Participants were pregnant women aged 14-21 (N=984). Medical record review and structured interviews were conducted. Longitudinal mixed modeling utilized to evaluate weight change trajectories in control and intervention groups, and stratified by prenatal depression and distress.

Results: Thirty five percent of participants were overweight or obese and >50% had excessive weight gain (Institute of Medicine standards). Women at clinical sites randomized to group prenatal care gained less weight during pregnancy and lost more weight one-year post-partum, compared to controls ($p<0.0001$). This effect was sustained among women categorized as obese based on pre-pregnancy BMI ($p<0.01$). Prenatal depression and distress were significantly associated with more antepartum weight gain and postpartum weight retention; women with highest levels of depression and distress exhibited greatest intervention benefit.

Conclusions: Results demonstrate that group prenatal care has a significant positive effect on pregnancy weight gain trajectories and postpartum weight loss that extends to 12-months postpartum, and mitigates effects of depression and distress. These findings are accentuated among women with pre-pregnancy obesity. Few studies to date have demonstrated an effect of lifestyle interventions on either gestational weight gain or postpartum weight loss, especially among those who are obese. Targeted efforts are needed during and after pregnancy to improve weight gain trajectories and overall health.

Associations between pre-pregnancy dietary patterns and risk of gestational diabetes: findings from an Australian population-based cohort study

Danielle AJM Schoenaker¹, Sabita S Soedamah-Muthu², Leonie K Callaway³, Gita D Mishra¹

1. School of Public Health, University of Queensland, Brisbane, Queensland, Australia
2. Division of Human Nutrition, Wageningen University, Wageningen, The Netherlands
3. Departments of Obstetric and Internal Medicine, Royal Brisbane and Women's Hospital, Brisbane, Queensland, Australia

Background: Evidence on the role of overall diet before pregnancy in the prevention of gestational diabetes mellitus (GDM) is lacking. We aimed to examine associations between pre-pregnancy dietary patterns and incidence of GDM in a large population-based cohort study.

Methods: Our study includes 3,853 women participating in the Australian Longitudinal Study on Women's Health. Pre-pregnancy dietary patterns were identified from a validated food frequency questionnaire at baseline in 2003 using factor analysis. GDM was self-reported during 9 years follow-up and validated in a subsample. Log-binomial regression analyses were used to estimate relative risks (RR) and 95% confidence intervals (CI). Models were adjusted for time-varying socioeconomic, reproductive and lifestyle factors.

Results: Among 6,626 pregnancies, 292 GDM cases (4.4%) were documented. Four dietary patterns were identified. The 'Fruit and low-fat dairy' and 'Cooked

ORAL PRESENTATION ABSTRACTS

vegetables' patterns were not associated with GDM. The 'Meat, snacks and sweets' pattern was associated with higher GDM risk after multivariable adjustment (RR [95% CI] per SD increase in score: 1.38 [1.02-1.86]), which was attenuated after adjustment for BMI (1.35 [0.98-1.81]). In stratified analysis, the 'Meat, snacks and sweets' pattern was associated with significantly higher GDM risk in obese women (2.08 [1.18-3.62]). The 'Mediterranean-style' pattern was associated with a 15% lower GDM risk in the fully adjusted model including BMI (95% CI 0.76-0.98). This was consistent across subgroups of women by BMI.

Conclusions: Our findings indicate that a pre-pregnancy 'Meat, snacks and sweets' dietary pattern is associated with higher GDM risk, particularly in obese women. Moreover, a pre-pregnancy 'Mediterranean-style' dietary pattern may have a role in the prevention of GDM.

Post-prandial glucose monitoring in pregnant women with diabetes is associated with reduced risk of foetal macrosomia

Boyle LD, Chalmers J, Patterson C, Franks C, Osborne L. Diabetes Centre, NHS Fife, Victoria Hospital, Hayfield Road, Kirkcaldy, Fife, Scotland KY2 5AH

Background: Obesity in pregnancy may be associated with increased risk of both foetal macrosomia and emergency delivery. Recent data suggests that bariatric surgery lowers the risk of gestational diabetes. Limited available evidence also suggests that post-prandial glucose monitoring is superior to pre-prandial for the risk of foetal macrosomia.

Methods: Between 2009 and 2015, data including BMI, delivery method and birth weight was collected on pregnant women with T1DM, T2DM or gestational diabetes (diagnosed using OGTT after reviewing risk factors at booking appointment). Obesity defined as BMI>30. We compare data on two groups; pre--prandial, and post-prandial glucose monitoring delineated by the adoption of the SIGN Diabetes guideline in July 2012. Analysis includes linear regression, the chi-squared test and independent samples t-test.

Results: In our study population (n=497 women), mean age 29 and meanBMI34, we found no correlation

between BMI at booking and birth weight. We found no significant association between obesity and risk of delivery via emergency caesarean section. However, in pregnant women with T1DM, T2DM or GDM, switching from pre-prandial to post-prandial glucose monitoring was associated with a mean reduction in birth weight of 164g ($p=0.0024$) between the two groups.

Discussion: Our results suggest that switching to post-prandial glucose monitoring may reduce the risk of foetal macrosomia. This effect may be partially accounted for by NHS Fife's adoption of the SIGN guideline, which lowered the glycaemic threshold for the diagnosis of GDM using OGTT from 5.5mmol at 0min and 9.0mmol at 120min to 5.1mmol and 8.5mmol respectively.

Total- and trimester-specific gestational weight gain and offspring body weight at birth, and at age 1, among monozygotic twin mothers and their offspring

Elina Scheers Andersson (speaker)¹, Per Tynelius¹, Thorkild IA Sørensen², Finn Rasmussen¹

1. Karolinska Institutet (Department of Public Health Sciences), Stockholm, Sweden
2. University of Copenhagen (Institute of Preventative Medicine), Copenhagen, Denmark

Background: Gestational weight gain (GWG) has in numerous studies been positively associated with offspring birth weight (BW) and body weight in childhood. However, these associations might be explained by genetic confounding as offspring may inherit their mother's genetic potential to gain weight. Furthermore, little is known about whether particular periods of pregnancy could influence offspring body weight differently. To investigate the assumption of genetic confounding, we aimed to explore total and trimester-specific effects of GWG in monozygotic (MZ) twin mother-pairs on their offspring's BW and weight at 1y.

Methods: MZ twin mothers born 1962-1975 were identified in national Swedish registers, and data on GWG and offspring BW and weight at 1y was collected from antenatal and child health centre records. We used generalized estimating equations to analyze associations within and between MZ twin mother-pairs.

ORAL PRESENTATION ABSTRACTS

Results: We had complete data on the mothers' GWG and offspring BW and weight at 1y for 70 twin mother-pairs. Total or trimester-specific GWG was not associated with either BW or weight at 1y, with one exception: a significant positive association within MZ twin mother-pairs' second trimester GWG and offspring sex- and gestational age-adjusted BW z-scores (2.17 units (corresponding to 0.98 kg) for each 1-kg/wk increase [95% CI: 0.05, 4.28]). However, the limited sample size yields rather broad confidence intervals, thus the results do not preclude other important associations.

Conclusion: The study supports that previously observed associations between second trimester GWG and BW are not due to genetic or familial environmental confounding.

Key words: gestational weight gain, birth weight, childhood body weight, genetics, twin study

ORAL PRESENTATION ABSTRACTS

DAY 2

Maternal obesity significantly alters uterine expression of oxytocin receptors and ex vivo contractile response to oxytocin during labour in the rat.

Ronan Muir¹, Bethan Clifford¹, Sarah McMullen¹, Raheela Khan², Anatoly Shmygol³, Siobhan Quenby³, Matthew Elmes¹.

1. Division of Nutritional Science, School of Bioscience, University of Nottingham, Sutton Bonington Campus, Loughborough, England, United Kingdom, LE12 5RD.
2. Graduate School of Medicine, University of Nottingham, Royal Derby Hospital, Uttoxeter Road, Derby, England, United Kingdom, DE22 3DT.
3. Reproductive Health & Biomedical Research Unit, University of Warwick, Coventry, Warwickshire, England, United Kingdom, CV2 2DX.

Maternal obesity rates are increasing significantly worldwide and associated with prolonged and dysfunctional labour and increased risk of emergency caesarean delivery. Oxytocin (OXT) is a potent uterotonic often used to augment and manage uterine dystocia. This study investigated whether obesity has adverse effects upon uterine expression of oxytocin receptors (OXTR) and contractile response to OXT during labour in the rat. Female Wistar rats were fed either a control chow (CON n=7) or an obesity inducing high-fat, high-cholesterol (HFHC) (n=7) diet 6 weeks before mating and during pregnancy. Rats were then euthanized during labour for collection of uterine tissue for ex vivo myometrial contractile studies and determination of OXTR protein expression. During labour OXTR expression was significantly higher in the uterus of HFHC fed rats compared to CON ($P<0.02$) (Figure 1A). Spontaneous contractile activity of uterine strips from both CON and HFHC fed rats responded to increasing doses of OXT with increases in integral activity, however HFHC rats exhibited a blunted response requiring higher concentrations of OXT than CON to increase integral activity (Figure 1B). Sigmoidal dose response analysis confirmed that logEC₅₀ and hillslope were significantly different between CON and HFHC animals. CON rats were more sensitive to OXT with a logEC₅₀ of -10.25M compared to -8.84M in HFHC ($P<0.05$). In contrast, HFHC animals had a significantly steeper hillslope ($P<0.05$) relative to CON (0.90 vs 1.55). In conclusion HFHC induced obesity increases uterine expression of oxytocin receptor and decreases the uterine response to OXT during labouring in the rat.

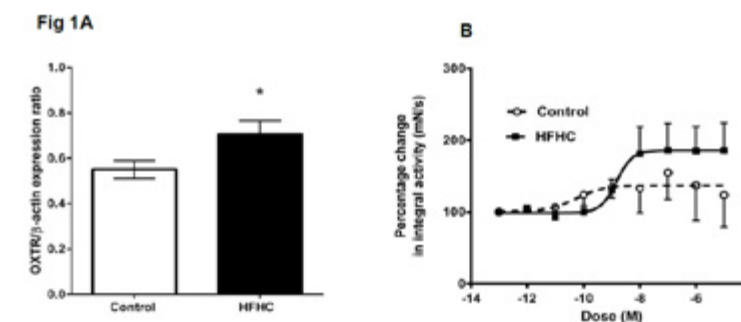


Figure 1A – Uterine oxytocin receptor expression and **1B** uterine contractile response ex vivo to increasing doses of oxytocin from control (n=7) or high-fat, high-cholesterol (n=7, HFHC) fed rats during labour. * signifies a significant difference between CON and HFHC rats at the $P<0.05$ level.

ORAL PRESENTATION ABSTRACTS

High density lipoprotein from pregnant women improves non-pregnant rat uterine artery function

Wan Noraini Wan Sulaiman, Elisabeth Beattie, Fiona Jordan, Josephine Cooney, Delyth Graham and Dilys Freeman
Institute of Cardiovascular and Medical Sciences, University of Glasgow, Glasgow, Scotland, UK

High density lipoprotein (HDL) has been shown to protect the vascular endothelium in non-pregnant individuals and plasma HDL concentration is elevated in pregnancy. We hypothesised that HDL synthesised in pregnancy differs in structure and function from non-pregnant HDL and has enhanced vascular protective functions. The aim of this study was to compare the effects of HDL from healthy pregnant and non-pregnant women on ex vivo vascular function using rat uterine arteries. HDL was isolated using density ultracentrifugation and desalted. Uterine arteries (UA) isolated from non-pregnant (n=4) and day 18 pregnant WKY female rats (n=3) were incubated with 2% pregnant or non-pregnant HDL overnight. Vessel function in response to increasing doses of noradrenaline (1×10^{-9} – 1×10^{-5} M) and carbachol (1×10^{-8} – 1×10^{-5} M) was assessed using wire myography. Contraction response of non-pregnant rat UA to noradrenaline in the presence of pregnant HDL was lower than those exposed to non-pregnant HDL [active effective pressure [AEP] mean (standard error) 31.9 (3.1) vs 52.5 (0.8) kPa, $p=0.008$]. Vessels exposed to pregnant HDL, compared to non-pregnant HDL, had less tension in the presence of 10^{-5} M carbachol [AEP 11.7 (4.3) vs 24.3 (3.0) kPa $p=0.074$] but this did not reach statistical significance (n=3). In pregnant rat UA differences between pregnant and non-pregnant HDL were not observed. In conclusion, pregnant HDL has better vascular protective properties than non-pregnant HDL. This effect may not be observed in pregnant rat UA due to vascular remodelling effects. These observations will now be studied in pregnant human vessels.

Obstetric energy metabolism and associations with subcutaneous adipose tissue in lean and overweight/obese pregnancy.

E Jarvie¹, J Gill¹, J Lovegrove², B Meyer³, D Freeman¹

1. Institute of Cardiovascular & Medical Sciences, University of Glasgow,
2. Food & Nutritional Sciences, University of Reading, 3School of Medicine, University of Wollongong, Australia.

Gestational total body weight and fat mass gain is of a similar magnitude in lean and obese pregnancies. The explanation for this similarity has not been explored. We compared gestational changes in three components of energy metabolism (energy expenditure, physical activity and macronutrient intake) in lean (LP) and overweight/obese pregnancy (OP), and related these to subcutaneous fat accumulation. Basal metabolic rate (BMR) and substrate utilisation (indirect calorimetry), moderate & vigorous physical activity (MVPA) (accelerometers), dietary intake (24 hour recall), fat mass (air displacement plethysmography) and subcutaneous fat thickness (sum of seven point skinfolds) were recorded at 15, 25 and 35 weeks' gestation. A linear mixed model (SPSSv19) identified a gestational increase (10%) in BMR ($p<0.0001$) with OP 22% higher than LP ($p<0.0001$). LP had 15% higher BMR/kg than OP ($p<0.0001$). Carbohydrate oxidation was 20% higher ($p<0.0001$) and fat oxidation 36% lower ($p<0.0001$) in LP versus OP, reflecting a more flexible gestational metabolic response resulting from relative insulin sensitivity. No differences were observed in dietary intake. Overall there was a 38% fall in MVPA ($p=0.008$) over gestation. LP were 52% ($p=0.008$) more active than OP. Univariate analysis showed no associations between change in fat mass or total body skinfolds and any component of energy metabolism. There was a significant association between BMR/kg and MVPA ($r=0.33$, $p=0.001$). The main differences between lean and obese pregnancy were substrate utilisation and physical activity. Our data suggest a focus on physical activity to improve metabolic health in pregnancy might be more advantageous than diet.

ORAL PRESENTATION ABSTRACTS

Placental markers of aging are altered in pregnancies complicated by preeclampsia and intrauterine growth restriction

Lucy Williamson, Dagmara McGuinness[†], Fiona Jordan, Paul Sheils[†], Dilys Freeman, Institute of Cardiovascular and Medical Sciences and [†]Institute of Cancer Sciences, University of Glasgow, Glasgow, G12 8QQ. UK

Telomere length is a marker of biological aging and shortening leads to increased CDKN2A expression and cellular senescence. Other markers of aging include Sirtuin 6 involved in DNA repair, and α -klotho involved in growth factor signalling and vascular function. The aim was to assess biological aging in preeclampsia (PE) and intrauterine growth restriction (IUGR). DNA and RNA were isolated from maternal leukocytes and placental tissue; control (n=38), PE (n=26) and IUGR (n=12). Telomere length (TL), relative to a standard (T/S ratio), and gene expression were assessed using real-time PCR. Maternal TL were similar between groups whereas placental TL was longer in PE compared to control [mean (SD) 0.61 (0.15) vs 0.39 (0.20), $P=0.001$]. In IUGR placenta TL were longer but not significantly. Placental expressions of α -klotho was lower in PE (52%, $p<0.001$) and IUGR (57%, $p<0.001$); CDKN2A was lower in PE (69%, $p=0.01$); and Sirtuin 6 was not different. There was a positive correlation between telomere length and systolic blood pressure (SBP) in the PE & IUGR combined groups ($r=0.46$, $P=0.033$). There were inverse correlations between SBP and CDKN2A ($r=-0.46$, $p=0.010$) and sirtuin 6 ($r=-0.64$, $P<0.001$). Reduced cell replication in PE placenta may explain the longer TL. This may be accompanied by reduced cellular senescence and reduced vascular function, indicated by other aging markers. Aging marker relationships with maternal SBP may reflect the maternal response to compromised placental cell replication. These data suggest that in PE placenta cells do not efficiently replicate and do not reach senescence by delivery.

POSTER PRESENTATIONS

The poster abstracts are ordered by alphabetical order of first author. The presented posters will be displayed in the exhibition and refreshment area.

Poster Number	Author Name	Poster Abstract Title
A28	Ahuja Ashish	Role of Bariatric Surgery on Obesity in Polycystic ovarian Syndrome & Infertility
A19	Alexandra Derveaux	Interest of using continuous glucose monitoring system (cgms) among pregnant women undergone a bariatric surgery at 24-28 gestation weeks
A05	Alyssa Fitzpatrick	Maternal labour and postpartum outcomes in women who are overweight or obese – the effect of gestational weight gain in the LIMIT study (Limiting weight gain in overweight and obese women during pregnancy to improve health outcomes)
A14	Anette Kersting	The impact of childhood maltreatment on pre-pregnancy BMI and maternal postpartum mental health
A02	Carol Ann Richardson	Seeking the True BMI (Best Maternity Input)
A18	Charlotte Grimminger	Improving maternal and perinatal nutrition and lifestyles services for an obese population in a hospital setting
A17	Ellinor Olander	What behaviour change techniques may help women be physically active in pregnancy? A systematic review and meta-analysis
A21	Eric Edison	Bariatric surgery in obese women of reproductive age improves fitness for pregnancy
A12	Goele Jans	Depressive and anxious feelings are more pronounced in pregnant women with a history of bariatric surgery compared to normal weight and obese pregnant controls
A01	Jamile Marchi	Risks for the mother and baby associated with obesity in pregnancy: a systematic review of reviews
A06	Jessica Bryant	The effect of a patient centred, multi-disciplinary weight management intervention on gestational weight gain
A07	Jessica Bryant	Changes in dietary intake and diet behaviours of pregnant women attending a specialist weight management service
A26	Loren Cain	Impact of 2009 Institute of Medicine Gestational Weight Gain Guidelines Adherence on Maternal and Infant Body Composition
A25	Mahmi Fujimori	Maternal pregravid obesity changes hormonal and immunolocial components in serum and colostrum
A23	Nicola Heslehurst	The association between maternal body mass index (BMI), prolonged pregnancy and post-term birth: a systematic review with meta-analysis
A29	Ojochenemi Joy	Knowledge, attitudes and practice (KAP) of Pregnant Women towards Maternal Obesity in Nigeria
A10	Sarah Hillier	Engaging women in postnatal weight management: is there an opportune time?
A03	Sara Carlhäll	Maternal Obesity (Class I-III), Gestational Weight Gain and Maternal Serum Leptin Levels During and After Pregnancy
A13	Virginia Allen-Walker	Exploring weight management in pregnancy: How do women feel about being routinely weighed during pregnancy?

POSTER PRESENTATION ABSTRACTS

Role of Bariatric Surgery on Obesity in Polycystic ovarian Syndrome & Infertility

Ahuja Ashish M.S,Associate Professor, Nain Prabhdeep Singh,Professor, Department of Surgery, Dayan and Medical College & Hospital, Ludhiana, (Pb) INDIA

Introduction: Polycystic ovarian syndrome (PCOS) is the most common endocrine disorder among women of reproductive age. Pcos encompasses a broad spectrum of signs and symptoms of ovary dysfunction, obesity, blood pressure, insulin resistance & infertility. Bariatric Surgery can be an effective means of weight loss in Pcos & curing Infertility .

Material & Method: 15 female patients were enrolled in the study from 2012-2014. 66%(n=10) Were in age group of 20-25 years, 33%(n=5) were in age group of 25-33 years who underwent Bariatric surgery in form of Laproscopic sleeve Gastrectomy (LSG)& Roux-en-Y gastric bypass. LSG 73% (n=11), RYGB26% (n=4)

Results: There was a significant improvement in obesity (60% excess weight loss)over 1 year after bariatric surgery, in 12 patients there was gross improvement in restoration of menstrual cycle who had irregular menstrual cycle. In 80% patients the serum insulin level showed normal value. Over two years 8 patients become pregnant.

Conclusion:

- 1) Obese women with Pcos maybe able to conceive after Bariatric Surgery.
- 2) Women with Pcos should only consider bariatric surgery if they were already considering it for other reasons to treat obesity,blood pressure & other co-morbid conditions .

Key words: Polycystic ovarian Syndrome(PCOS),LSG (Laprosopic Sleeve Gastrectomy, RYGB Roux-en-Y Gastric bypass.

Interest of using continuous glucose monitoring system (CGMS) among pregnant women undergone a bariatric surgery at 24-28 gestation weeks

Derveaux A.¹, Deruelle P.³, Vambergue A.², Caiazzo R.⁴, Romon M.¹, Pattou F.⁴, Pigeyre M.¹

- 1. Department of Nutrition, University Hospital in Lille, France,
- 2. Department of Diabetology, University Hospital in Lille, France,
- 3. Department of Obstetrics, University Hospital in Lille, France
- 4. Department of Endocrine Surgery, University Hospital in Lille, France

Introduction: Among pregnant women, who had undergone bariatric surgery, it is difficult to evaluate glycemic status. Our objective was to describe glycemic profile at 24-28 gestation weeks by using a Continuous Glucose Monitoring System (CGMS), in this population and to compare our data with data in pregnant women without surgery (1).

Methods: CGMS was used to assess the glycemic profile during 72h in 12 pregnant women, who undergone bariatric surgery (8 malabsorptive and 4 restrictive procedures) compared to a referent population of 15 obese pregnant women. As the same time, a 75g Oral Glucose Tolerance Test (OGTT) was performed and its tolerance was evaluated.

Results: Median maternal age was 28.5 years (24-41), prepregnancy BMI was 34.4 kg/m²(20.3-55.2) and time to pregnancy after surgery was 2.5 years (0-8). CGMS values showed that mean time spend with interstitial glucose concentration (IGC)< 70mg/dl was 24.2± 27.3% , IGC> 120mg/dl was 9.6± 6%. Comparatively with obese pregnant women with equivalent BMI, our 12 pregnant women had earlier postprandial peak time and lower 2h postprandial IGC. 24h mean IGC and fasting IGC was not different between groups. During OGTT: 2 patients were diagnosed for gestational diabetes mellitus (GDM) and 4 had intolerance with vomiting.

POSTER PRESENTATION ABSTRACTS

Conclusion: CGMS is useful to examine the particular glycemic profile among pregnant women with bariatric surgery, when it is difficult to diagnose a GDM, especially following gastric bypass. The variability of glycemic can be explained by the consequences of surgery.

(1)Yogev et al. Am J Obstet Gynecol. 2004.

Maternal labour and postpartum outcomes in women who are overweight or obese – the effect of gestational weight gain in the LIMIT study (Limiting weight gain in overweight and obese women during pregnancy to improve health outcomes)

A Fitzpatrick^{1,2}, R Grivell^{2,3}, T Tran³, JM Dodd^{2,3}

1. The University of Oxford, Nuffield Department of Population Health; Oxford, UNITED KINGDOM

2. The Women's and Children's Hospital, Women's and Babies Division, Department of Perinatal Medicine; North Adelaide, South Australia, AUSTRALIA

3. The University of Adelaide, School of Paediatrics and Reproductive Health, and The Robinson Research Institute; Adelaide, South Australia, AUSTRALIA

Introduction: High BMI and excessive gestational weight gain in pregnancy are associated with adverse intrapartum and postpartum maternal outcomes. The current study is a cohort study nested in the control group of the LIMIT trial (an RCT assessing if antenatal lifestyle advice improved outcomes for women with a high BMI) and aimed to assess the relationship between gestational weight gain (GWG) and adverse intrapartum and postpartum outcomes.

Methodology: The risk of induction of labour (IOL), requiring antibiotics, perineal trauma, Caesarean section, post-partum haemorrhage and maternal readmission were assessed against total or weekly GWG among women in the non-intervention arm using a log binomial regression model. The model was adjusted for age, parity, race, smoking and socioeconomic status, with significance set at $p < 0.05$.

Results: Total gestational weight gain was available for

868 women, and weekly GWG for 866 women. There was no significant relationship between higher total GWG and any of the major adverse outcomes. Women who gained less weight than recommended experienced an elevated risk of IOL for fetal compromise compared to those women who achieved the recommended weight gain (RR 2.66 (1.14-6.19), $p = 0.0237$). Women with weekly weight gain in excess of recommendations did not experience an increased risk of adverse outcomes, but had a lower risk of IOL than women who gained weight within recommended limits (RR 0.64 (0.52-0.79), $p < 0.001$).

Conclusions: The study did not demonstrate increased risk of adverse intrapartum and postpartum outcomes in women with higher GWG, and raised the possibility of harm with limited weight gain.

The impact of childhood maltreatment on pre-pregnancy BMI and maternal postpartum mental health

Anette Kersting^{a,b}, Michaela Nagl^{a,b}, Franziska Lehnig^{a,b}, Holger Stepanc, Birgit Wagner^d

a. Leipzig University Medical Center, IFB AdiposityDiseases, Leipzig, Germany

b. University of Leipzig, Department of Psychosomatic Medicine and Psychotherapy, Leipzig, Germany

c. University of Leipzig, Department of Obstetrics, Leipzig, Germany

d. MSB Medical School Berlin, Department of Clinical Psychology and Psychotherapy, Berlin, Germany

Purpose: Maternal obesity is a common risk obstetric condition. Mental disorders during the perinatal period are also common and there is evidence that obese pregnant women are at greater risk of impaired mental health than normal weight women. In general population studies a history of childhood maltreatment has been found to be associated with both obesity and mental disorders. Our cross-sectional study aimed to examine interrelations between childhood maltreatment, pre-pregnancy BMI and maternal postpartum anxiety and depression.

Methods: 777 women were contacted within 16 weeks postpartum. Childhood maltreatment was assessed using

POSTER PRESENTATION ABSTRACTS

the Childhood Trauma Questionnaire. Depression was measured using the BDI, and anxiety using the Symptom-Checklist-90-revised. Pre-pregnancy BMI was assessed via retrospective self-report.

Results: Severe childhood physical abuse and severe childhood physical and emotional neglect was associated with a 3.2 to 4.4-fold risk of pre-pregnancy obesity relative to normal weight. Childhood maltreatment was also associated with an increased risk of elevated depressive and anxiety symptoms, and pre-pregnancy obesity with an increased risk of postpartum depression (OR=2.5, 95%CI: 1.1-5.8) but not of anxiety. When using pre-pregnancy BMI and childhood maltreatment as predictors, the association between pre-pregnancy obesity and depression attenuated (OR=2.1, 95%CI: 0.8-5.2) indicating that childhood maltreatment at least partly accounts for the association between obesity and depression.

Conclusion: Obese pregnant women may constitute a subgroup that is at higher risk of impaired mental health after delivery and might be in need of targeted support. A history of childhood abuse may be an important barrier to both obesity and depression treatment.

Seeking the True BMI (Best Maternity Input)

C. Richardson¹, E. V. Teijlingen², V. Hundley³ and C. Wilkins⁴

Maternal obesity in the UK is a growing public health problem with clear guidelines regarding gestational weight gain remaining absent within UK maternity services. It is understood that limiting gestational weight gain throughout pregnancy particularly amongst women who are obese at the beginning of their pregnancy can reduce serious health risks to both women and their babies. At present it is unclear how best to deliver maternity services to this specific group of women. The study objective will establish what obese pregnant women and midwives understand about weight gain in pregnancy alongside developing an insight into what guidance they seek out.

The study methodology will be mixed methods using an explanatory sequential approach, using online surveys

for the qualitative element of the research with follow up interviews for the contextual qualitative element of the study. The findings will be analysed using SPSS to generate descriptive statistics and thematic analysis for the qualitative element of the study. This study will provide a deeper appreciation of pregnant women's understanding of gestational weight gain and aims to provide firm evidence to support women appropriately in the future.

Nutrition and healthy lifestyles interventions to improve maternal and perinatal health in overweight and obese pregnant women

Dr Charlotte Grimmering¹, Dr Jonathan Broad^{1,2}, Ms Lucy Marquis¹, Miss Pander¹

1. Torbay Hospital Horizon Centre

2. School of Social and Community Medicine, University of Bristol

Background: Torbay hospital obesity in pregnancy policy supports behavioural change through midwife advice, regular weighing, and dietician referrals. This presentation assesses adherence to and patients' experience of this policy and outlines plans to improve support for healthy lifestyles in the perinatal period.

Methodology: We audited 16 notes between November 2014 and April 2015 for records of antenatal lifestyles discussions, postnatal weight management plans and referrals to dieticians. This will be complemented by a survey and semi-structured interviews of patients' experiences and perceived lifestyle impact. This will inform an educational initiative for health professionals and written, video and digital patient information. In future we aim to develop a peer-group initiative.

Results: Of 16 patients, 11 had their weight and its impact on their pregnancy discussed at the initial booking. 12 were offered to be weighed at 20 weeks' gestation and five accepted being weighed, whilst one accepted being weighed at 28 weeks' gestation. 11 were offered a referral to dietician, of which 10 declined. 11 had healthy eating discussed and 12 had vitamins discussed. None had a documented postnatal weight management plan.

POSTER PRESENTATION ABSTRACTS

Conclusion: The majority of patients were managed according to local guidelines, although none accessed additional services and there is scope for improvement. We will also present the complementary findings of qualitative analysis of women's experience of the services. We aim to increase the empowerment of women to improve perinatal nutrition and lifestyles through written and interactive media and by increasing health professionals' skills in providing motivational advice.

What behaviour change techniques may help women be physically active in pregnancy? Asystematic review and meta-analysis.

Olander, E.K.¹, Atkinson, L.², French, D.P.³

1. Centre for Maternal and Child Health Research, City University London, United Kingdom
2. Coventry University, United Kingdom
3. School of Psychological Sciences, University of Manchester, United Kingdom

Background: Despite numerous benefits associated with physical activity (PA) during pregnancy, most pregnant women decrease their PA behaviour. It is thus important to identify what intervention components, known as behaviour change techniques (BCTs), may be associated with PA.

Aim: To identify which BCTs are associated with PA behaviour during pregnancy. Methods: A search of six databases identified 24 controlled trials reporting PA behaviour. Included interventions had to measure PA at least twice in pregnancy and have a control group. All intervention descriptions were coded with the 40 item CALO-RE taxonomy of BCTs. Meta-analysis and moderator analyses were conducted to examine the association across studies between the presence or absence of specific BCTs within interventions and changes in PA behaviour.

Results: The overall effect size for intervention effects was $d = 0.41$. Sixteen BCTs were identified in the included interventions, of which ten were associated with a decreased level of PA. Two BCTs ('prompt self-monitoring of behavioural outcome' and 'provide instruction on how to perform the behaviour') were associated with a higher

level of PA compared to when these BCTs were not included in the intervention.

Conclusions: These findings suggest that interventions should include practical elements such as instructing women how to be active and encourage self-monitoring of the outcomes of their PA (for example weight). These results also suggest that caution may be needed in applying BCTs that are associated with PA behaviour in non-pregnant adults as they may be less suitable for pregnant women.

Bariatric surgery in obese women of reproductive age improves fitness for pregnancy

Eric Edison, Martin Whyte, Simon Jones, Piers Gatenby, Simon de Lusignan, Jill Shawe, University of Surrey, Guildford, Surrey GU2 7XH

Aim: To describe the female population of reproductive age having bariatric surgery (BS) in the UK. To assess the effect on factors underlying fertility, maternal and foetal outcomes.

Methods: Data were extracted from the UK National Bariatric Surgery Registry (NBSR) for women aged 18---45 years: demographics, BMI, comorbidities and operation type. Cases were compared with the Health Survey for England (HSE) for 2007---2013 (women 18---45 years, BMI ≥ 40). Analyses were performed using "R" statistical software.

Results: Data were extracted on 15222 women from NBSR dataset and 1073 from HSE. Non---caucasians were proportionally under---represented in the NBSR compared to HSE (10% vs 16% respectively, $p < 0.0001$). The NBSR group were 1.5 years younger (mean 34.6 vs 36.2 years,

$p < 0.0001$). Females aged 18---45 comprised 53% of bariatric procedures. BMI fell in the first year from 48.2 to 37.4 kg/m² ($p < 0.001$). Rates of all comorbidities including menstrual disorder, PCOS and diabetes reduced. Of those with menstrual disorder before, 12.4% ($p < 0.0001$) had regular menses afterwards.

POSTER PRESENTATION ABSTRACTS

However, of those operated on with a single comorbidity less than 1% had PCOS or menstrual dysfunction.

Conclusions: Bariatric surgery improves 'fitness for pregnancy' by decreasing weight and the rate of relevant comorbidities.

Access to BS can be improved. There may be value in identifying women earlier to facilitate the benefits to fertility. More equal access across ethnic groups is needed.

The effects on fertility may be underappreciated as gynaecological complications alone do not prompt referral.

Depressive and anxious feelings are more pronounced in pregnant women with a history of bariatric surgery compared to normal weight and obese pregnant controls

Jans G¹, Bogaerts A^{2,3}, Verhaeghe J^{1,4}, Dillemans D⁵, Lemmens L⁶, Van Nieuwenhove Y⁷, Saey J⁸, Grandjean P⁹, De Becker B¹⁰, Logghe H¹¹, Roelens K¹², Loccufier A¹³, Lannoo A^{14,15}, Van der Schueren B^{15,16}, Matthys M^{15,16}, Devlieger R^{1,4,10}

1. Department of Development and Regeneration, KU Leuven, Belgium
2. University College Leuven, Limburg (UCLL), Hasselt, Belgium,
3. Center for Research and Innovation in Care, Department of Nursing and Midwifery Sciences, University of Antwerp, Belgium
4. Department of Obstetrics and Gynecology, University Hospitals Leuven, Belgium
5. Department of Abdominal Surgery, General Hospital Sint-Jan Bruges, Belgium
6. Department of Abdominal Surgery, General Hospital Sint-Nikolaas, St-Niklaas, Belgium
7. Department of Abdominal Surgery, University Hospitals Ghent, Belgium
8. Department of General and Digestive Surgery, CHR Mons-Hainaut, Belgium
9. Department of Obstetrics and Gynecology, CHR Mons-Hainaut, Belgium
10. Department of Obstetrics, Gynecology and Reproduction, GZA, Campus Sint-Augustinus Wilrijk, Belgium
11. Department of Obstetrics and Gynecology, General Hospital Sint-Lucas, Bruges, Belgium
12. Department of Obstetrics and Gynecology, University Hospitals Ghent, Belgium

13. Department of Obstetrics and Gynecology, General Hospital Sint-Jan Bruges, Belgium
14. Department of Abdominal Surgery, University Hospitals Leuven, Belgium
15. Department of Clinical and Experimental Medicine, KU Leuven, Belgium
16. Department of Endocrinology, University Hospitals Leuven, Belgium

Background: Psychosocial health is a concern in pregnancy and after bariatric surgery (BS), but has not been studied in post-bariatric pregnancy.

Aim: Prospectively measure levels of depression and anxiety in pregnant women with a history of BS and to compare with normal weight and obese pregnant controls.

Methods: Pregnant women with previous BS were included within the AURORA project <15 weeks of gestation. Levels of depression (Edinburgh Depression Scale) and state and trait anxiety (Dutch version State-Trait Anxiety Inventory) were measured in trimester (T) 1 and 3 of pregnancy. Non-surgical pregnant controls were obtained from a prospective controlled cohort study. Statistical analyses involved repeated measure ANOVA tests.

Results: Twenty-four pregnant women with previous BS (BMI 28.7 \pm 5.6 kg/m²), 83 normal weight (BMI 21.8 \pm 1.5 kg/m²) and 25 obese (BMI 34.3 \pm 3.7 kg/m²) controls were included. Levels of depression, state and trait anxiety did not differently evolve in the BS group and controls from T1 to T3 ($P = 0.681$, $P = 0.182$ and $P = 0.930$ respectively). Higher levels of state anxiety were seen for the total group in T3 compared to T1 (37.6 vs 36.6, $P = 0.036$). Higher levels of depression and trait anxiety were found in the BS group compared to normal weight controls (9.6 vs 5.9, $P < 0.0001$ and 41.1 vs 34.1, $P = 0.001$), and higher levels of state anxiety in the BS group compared to normal weight (43.3 vs 35.1, $P < 0.0001$) and obese (43.3 vs 35.9, $P = 0.014$) controls.

Conclusion: Caution is needed as pregnant women with previous BS present with impaired psychosocial health compared to non-surgical controls.

POSTER PRESENTATION ABSTRACTS

Risks for the mother and baby associated with obesity in pregnancy: a systematic review of reviews

Jamile Marchi¹; Marie Berg^{2,3}; Anna Dencker^{2,3}; Ellinor K. Olander⁴; Cecily Begley^{1,2}.

1. School of Nursing and Midwifery, Trinity College Dublin, Dublin, Ireland;
2. Institute of Health and Care Sciences, Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden;
3. Centre for Person-Centred Care (GPCC), University of Gothenburg, Gothenburg, Sweden;
4. Centre for Maternal and Child Health Research, City University London, London, United Kingdom

Background: One- to two-thirds of women in reproductive age are overweight or obese in the US and Europe. Obesity is associated with maternal and neonatal complications and has become an issue of concern for policy-makers, healthcare providers and researchers.

Aim: This systematic review of systematic reviews, conducted in 2014, aimed to pool the findings on the risks of adverse outcomes in relation to maternal obesity.

Methodology: A protocol was developed a priori and a comprehensive search was conducted using the databases PubMed, CINAHL, Cochrane and Scopus from inception to May 2014. Reviews that compared pregnancy outcomes in women of healthy weight to outcomes in women with obesity were eligible for inclusion.

Findings: Twenty-two of the 624 original studies met inclusion criteria and methodological quality criteria using AMSTAR. Pooled findings showed that pregnant women with obesity were more likely to develop depression, gestational hypertension, diabetes mellitus, pre-eclampsia and have increased rates of instrumental birth, caesarean section and surgical site infection compared to women of healthy weight. Babies of women with obesity during pregnancy were at greater risk of being born preterm, being large-for-gestational-age, having a fetal defect, congenital anomaly or dying in the perinatal or neonatal period compared with babies of women of healthy weight. Also, women with obesity were less likely to initiate breastfeeding and more likely to breastfeed for a shorter time.

Conclusion: Maternal obesity increases the risk for a range of maternal and neonatal complications. Women planning pregnancy need support to help them lose weight prior to conception.

The effect of a patient centred, multi-disciplinary weight management intervention on gestational weight gain

Jessica Bryant (BSc Physiotherapy, MCSP), Charlie Townsend (BSc Nutrition and Dietetics) and Claire Lindsay (BSc Sports and Exercise Science, Pg Dip Nutrition and Dietetics)

Background: Obese women often cite pregnancy as a trigger for weight gain. The Ashton, Leigh and Wigan Specialist Weight Management Service (SWMS) offer a unique maternity pathway for pregnant women with BMI >35kg/m², with the aim of minimising gestational weight gain (GWG).

Method: Following midwife referral, patients attend multi-disciplinary clinics with a Dietitian and Physiotherapist (with additional input from a Midwife and Occupational Therapist). Behaviour change interventions are used to support patients to introduce positive dietary and lifestyle changes. Of 78 maternity pathway completers (Sept 2012 – June 2015), 10 were excluded due to incomplete data sets. Referral BMI was available for 54 patients (mean BMI 40 ±4.3kg/m²).

Results: Patients (n=68) attended an average of 4.4 ante-natal appointments, with a mean gestation at final ante-natal review of 31.6 weeks. Mean GWG was +6.0kg (+5.9% body weight). 70.6% of ante-natal pathway completers attended post-partum reviews (n=48). The mean weight gain between booking and 12 weeks post-partum was +1.6kg (+1.8%) body weight.

Conclusion: Patients engaging in the SWMS maternity pathway demonstrated GWG in accordance with the American Institute of Medicine (IOM) recommendations for obese women at full term (5.0-9.0kg). However, due to the nature of the service, the gestation at which a patient completes the SWMS maternity pathway is determined on an individual basis so their final ante-natal weight isn't necessarily the full term weight (range 21-38 weeks). Although a mean weight gain of 1.6kg between

POSTER PRESENTATION ABSTRACTS

booking and 12 week post-partum appears positive, no comparable data regarding recommendations for post-partum weight change exists to our knowledge

Notes: Further research – Effect of referral at gestation and no of appts attended on weight change...

Key challenges: The Health Improvement Midwife post was decommissioned in April 2015. Data is currently being collected to determine the impact on referral rates and patient engagement.

Changes in dietary intake and diet behaviours of pregnant women attending a specialist weight management service

Claire Lindsay (BSc Sports and Exercise Science, Pg Dip Nutrition and Dietetics), Charlie Townsend (BSc Nutrition and Dietetics) and Jessica Bryant (BSc Physiotherapy, MCSP)

Aim: To assess the change in diet and dietary behaviours of pregnant women who completed the maternity (ante-natal) pathway as part of an NHS Specialist Weight Management Service (SWMS).

Method: The Aintree Dietetic Outcome Tool (ADOT) is a self administered questionnaire that measures the consumption of foods and drinks important for a healthy pregnancy. It also assesses participation in dietary behaviours that promote healthy eating and appropriate weight management during pregnancy. 27 obese women (BMI 41.9 ±5.3m², 30.8± 6.2 years) completed the ADOT at initial assessment and at their final appointment prior to giving birth. Between these appointments, women attended multi-disciplinary clinics aimed at minimising weight gain during pregnancy.

Results: Overall, there was a 60% increase in the number of women who were able to meet the recommended fluid requirements everyday. Approximately 50 % of women increased the frequency of their dairy intake and the volume of fruit and vegetables they ate each week. In addition 37 % of women reduced the number of high calorie snacks they ate per week and 41% of women reduced how often they would drink a caffeinated beverage. Improvements in meal pattern and other dietary strategies to help improve their diet and prevent

excessive weight gain (e.g. reading food labels) were observed for approximately 30% of women.

Conclusion: The observed change in dietary intake and dietary behaviour indicates that the SWMS maternity pathway is successful at improving the diet and dietary behaviours of obese pregnant women.

Impact of 2009 Institute of Medicine Gestational Weight Gain Guidelines Adherence on Maternal and Infant Body Composition

Loren E. Cain¹, Jeffrey H. Burton¹, Abby F. Duhé¹, Karen E. Elkind-Hirsch², Elizabeth A. Frost¹, L. Anne Gilmore¹, Jeffrey Breaux², Leanne M. Redman¹ for the Expecting Success Study Team

1. Pennington Biomedical Research Center
2. Woman's Hospital

There is little data to describe the composition of gestational weight gain (GWG) in overweight and obese women relative to the 2009 IOM guidelines. In this study we tested the hypothesis that mothers with GWG above the IOM guidelines ('high-gainers') during pregnancy would experience a greater expansion of adipose tissue as compared to those who gained within the IOM guidelines ('ideal-gainers') and that infants born to high-gainers would be larger and have greater adiposity at birth. Weight, circumference measures, subcutaneous skinfold thickness and whole body air displacement plethysmography, were measured in the first (<13GA) and third (35-36GA) trimester of pregnancy in 50 overweight and obese pregnant women. Infant weight, circumferences and subcutaneous skinfold thickness was measured within 72h of delivery. Sixty-seven percent of overweight and 62% of obese women had excess GWG and were classified as high-gainers. GWG was significantly greater in the high-gainers compared to the ideal-gainers (12.99±0.71kg vs 4.74±0.95kg; p<0.0001) which was attributed to a significantly greater accumulation of fat mass (7.00±0.69kg vs. 0.37±0.92kg; p<0.0001). Increases in circumference measures and skinfold thickness (4 of 6 sites: subscapular, iliac crest, mid-thigh, mid-calf) were also significantly higher in the high-gainers (all p< 0.05). Infants of high-gainers had a significantly higher birth weight (3.30±0.08kg vs.

POSTER PRESENTATION ABSTRACTS

2.99±0.11kg; p=0.0258) but infant adiposity did not differ on the basis of maternal GWG status. In overweight and obese women, weight gain above the 2009 IOM guidelines is associated with increased adiposity, but this may not lead to increased adiposity in offspring at birth.

Funding: National Institutes of Health: U01DK094418 (LMR)

Clinicaltrials.gov registration: NCT01610752

Maternal pregravid obesity changes hormonal and immunological components in serum and colostrum

Fujimori M¹, Fiorin V², Morais TC³, Franca EL³, Honorio-Franca AC³, Abreu LC^{1,2}

1. Department of Maternal and Child Health, School of Public Health, University of Sao Paulo (USP), Sao Paulo, SP, Brazil.
2. Laboratory of Scientific Writing, Department of Morphology and Physiology, School of Medicine of ABC, Santo Andre, SP, Brazil.
3. Institute of Biological and Health Science Federal University of Mato Grosso – Pontal do Araguaia – MT, Brazil

Maternal obesity is associated with adverse perinatal outcomes and a number of long-term adverse health outcomes in the offspring. The complex relationships between the maternal metabolic milieu and the developing foetus have been studied but probably the changes in maternal obesity can also be transmitted from mother to infant through breastfeeding. The present study evaluated immunological and hormonal parameters present in maternal blood and colostrum of overweight and obese mothers. The women were divided for maternal blood and colostrum sampling according to their pregestational body mass index status: lean (n=15), overweight (n=15) and obese (n=15) groups. Leptin and adiponectin were measured using commercial ELISA kits. We determined cytokines levels by flow cytometer and C-reactive protein (CRP) concentration by turbidimetric method. Significant differences were verified in the levels of the cytokines tumor necrosis factor (TNF)- α , interleukin (IL)-6 and CRP only for the blood samples. Subjects with higher BMI showed the highest concentrations of these immunological markers. Obese mothers had the highest levels of serum and colostrum leptin. Maternal concentration of adiponectin decreased significantly in obese group, but this group showed the highest hormone levels in colostrum. Leptin in colostrum was

positively correlated with the concentrations in maternal blood but this was not verified for adiponectin. Data from This study show that maternal obesity leads to biological changes in hormonal and immunological components of human milk, which may represent implications for the protective and immunomodulatory role of breastfeeding in the perinatal period and against the occurrence of obesity in later moments of life.

Financial sponsorship: FAPESP, process no 2012/17843-8, 2012/16662-0.

Key words: obesity, blood, colostrum, cytokines, leptin, adiponectin

The association between maternal body mass index (BMI), prolonged pregnancy and post-term birth: a systematic review with meta-analysis

Heslehurst N¹, Vieira R¹, Hayes L¹, Crowe L¹, Jones D¹, Robalino S¹, Slack E¹, Rankin J¹

1. Institute of Health & Society, Newcastle University, Newcastle upon Tyne, UK

Aim: Existing systematic reviews investigating gestational age at delivery are limited to preterm pregnancy. Prolonged/post-term pregnancies have increased perinatal mortality, morbidity, and obstetric complications. This systematic review investigates the association between maternal BMI and prolonged/post-term birth.

Methods: The search strategy included database searches, and citation and reference list searches. Screening and data extraction were carried out by two researchers independently using standardised protocols. Primary research studies published in English after 1990 were included. Associations were investigated using a dose-response analysis by computing study-specific linear trends and 95%CI. The overall OR was calculated using a random-effects model. A potential non-linear relationship was assessed using fractional polynomial models. A likelihood ratio test was used to check linearity.

POSTER PRESENTATION ABSTRACTS

Results: Searches identified 15,931 titles/abstracts: 39 studies were included (combined population n=4,143,700). Most studies were published between 2005-2014 (n=33), from Northern Europe (n=20), Middle-East/Asia (n=9), USA (n=5), Canada (n=3), Australia (n=1) and South Africa (n=1). Eighteen studies had data available for meta-analysis (n=3,080,697). Linear analysis showed a significantly increased association between prolonged/post-term birth and each 5-unit BMI increase: OR 1.13 (95%CI 1.09-1.18, p<0.001, I² 92.3%). There was no evidence of a non-linear association. There was an increasing significant OR with each increasing obesity class (from 1.30 [BMI 30-34.9kg/m²] to 1.45 [≥40kg/m²]).

Conclusions: This preliminary meta-analysis has identified a significant association between maternal obesity and prolonged/post-term pregnancy. Further meta-analyses will be carried out adjusting for confounding variables and publication bias. Sensitivity analysis will explore the influence of additional factors with potential for bias (e.g. study quality).

Knowledge, attitudes and practice (KAP) of Pregnant Women towards Maternal Obesity in Nigeria

Authors: Ojochenemi J. Onubi¹, Debbi Marais¹, Lorna Aucott¹, Friday Okonofua², Amudha S. Poobalan¹

1. Institute of Applied Health Sciences, University of Aberdeen, Polwarth Building, Foresterhill, Aberdeen AB25 2ZD, United Kingdom
2. Department of Obstetrics and Gynaecology, College of Medical Sciences, University of Benin, P.M.B. 1154, Benin City, Edo State, Nigeria

Background: Maternal obesity is increasing worldwide, with significant maternal and child consequences. Lifestyle interventions have shown some success in preventing excess gestational weight gain (GWG). However, certain barriers may prevent mothers from engaging in these interventions. This study aimed to assess the knowledge, attitudes, and practices (KAP) of pregnant women towards maternal obesity.

Methods: A questionnaire survey of 435 pregnant women was conducted in seven hospitals across Nigeria. Questions asked included knowledge of the mother's own weight category; causes, complications, and safe ways to manage maternal obesity. Their attitudes and practice towards maternal obesity were also investigated.

Results: About 17.9% of the study population were obese; however, the majority (83.4%) perceived themselves to be normal weight. Women's knowledge of the causes and specific complications of maternal obesity was poor. Majority of them (85.3%) felt that pregnant women should avoid excess GWG, 25% very worried about putting on excess GWG, and 58.2% were taking steps to prevent excess GWG. Factors significantly associated with the practice of preventing excess GWG included a history of previous obstetric complications (p=0.001), receiving education about weight gain (p=0.027) and exercise (p<0.0001) in pregnancy, awareness of complications for the mother (p=0.002) and child (p<0.0001), and concerns about gaining excess GWG (p<0.0001).

Conclusions: Education of mothers about the consequences and safe ways to prevent excess GWG may increase their engagement with maternal obesity interventions. Pregnant women should be adequately supported to ensure they make the right choices in preventing excess GWG.

Engaging women in postnatal weight management: is there an opportune time?

Hillier, S. E¹. and Avery A¹.

1. Slimming World, UK

Introduction: It is well reported that women who enter pregnancy overweight or obese have a higher risk of adverse outcomes for themselves and their infants. The postnatal period has been identified as an appropriate time to engage women in weight management. The aim of this study was to identify membership commencement and weight loss outcomes in women who opted to engage in a commercial weight management (CWM) programme during the postnatal period.

Methods: Female members up to 2 years postnatal were invited to complete a survey hosted on the Slimming World website. The survey used quantitative questions to determine programme commencement, current duration and self-reported height. Weight was confirmed from the weekly weight data electronically recorded as part of each participant's membership.

POSTER PRESENTATION ABSTRACTS

Results: 1015 women completed the survey (32.2 ± 5.1 years). Mean BMI ($n=971$) on joining was 33.2 ± 5.8 kg/m² and at the time of the survey was 30.5 ± 5.9 kg/m². The largest proportion of women reported engaging in the CWM programme between 6-26 weeks (combined, 45.7%, $n=463$) and >1 year (23.4%, $n=238$) postnatal. Greater weight loss was reported in women who engaged with the weight management programme between 6-12 weeks (23%, $n=233$) postnatal compared to those who engaged >1 year, when adjusted for membership length ($P<0.05$).

Conclusions: Engaging in a CWM programme as a postnatal woman can lead to weight loss. The results suggest those that engage with weight management services soon after birth are more likely to experience greater weight losses.

Maternal Obesity (Class I-III), Gestational Weight Gain and Maternal Serum Leptin Levels During and After Pregnancy.

Sara Carlhäll MD¹, Marie Bladh MA¹, Jan Brynhildsen MD, PhD¹, Ing-Marie Claesson RNM, PhD¹ Ann Josefsson MD, PhD¹, Gunilla Sydsjö PhD¹, Annika Thorsell, PhD², Marie Blomberg MD, PhD¹

1. Department of Obstetrics and Gynaecology and Department of Clinical and Experimental Medicine, Linköping University, Linköping, Sweden.
2. Division of Cellbiology, Department of Clinical and Experimental Medicine, Faculty of Health Sciences, Linköping University, Linköping, Sweden.

Objective: To evaluate if maternal serum leptin (s-leptin) levels during and after pregnancy were associated with different degrees of maternal obesity and gestational weight-gain.

Method: Prospective cohort study including women categorized as obesity class I-III ($n=343$) and divided into three gestational weight-gain groups ($n=304$), based on the Institute of Medicine's guidelines. Maternal s-leptin was measured at 15 and 29 weeks of gestation and 11 weeks postpartum. Maternal Body Mass Index (BMI) was calculated from early pregnancy weight. Gestational weight-gain was defined as weight at time of

delivery minus early pregnancy weight. Stratified linear regression analyses were used to study the association between leptin levels and degree of maternal obesity and gestational weight-gain. Adjustments were made for gestational age and for weight-gain analyses also maternal BMI.

Results: Maternal s-leptin levels during and after pregnancy were increased with increasing degree of maternal obesity and to a minor extent with increasing degree of gestational weight-gain ($p<0.05$).

Conclusion: The results suggest that the higher degree of maternal obesity and gestational weight-gain, the higher were levels of s-leptin. The degree of gestational weight-gain seemed to be of minor importance for the s-leptin value compared to early pregnancy BMI in obese women. Obesity implies risks for pregnancy complications, which increases with maternal BMI. Since maternal s-leptin levels correlated with maternal BMI, leptin may be involved in the pathogenetic mechanisms of obesity on pregnancy outcome.

Exploring weight management in pregnancy: How do women feel about being routinely weighed during pregnancy?

V Allen-Walker¹, L Mullaney², DMA McCartney², J Woodside¹, V Holmes¹, MJ Turner³, MC McKinley¹

1. Centre for Public Health, School of Medicine, Dentistry and Biomedical Sciences, Queen's University Belfast.
2. School of Biological Sciences, Dublin Institute of Technology.
3. UCD Centre for Human Reproduction, Coombe Women and Infants University Hospital, Dublin.

Background: Overweight and obesity in pregnancy has increased in the last two decades. Routinely weighing women during pregnancy ceased in the 1990s and there are no UK guidelines for appropriate gestational weight gain. There is debate about whether routine weighing should be reintroduced for clinical and epidemiological reasons¹. However, the potential for harm (e.g. causing anxiety in women), as well as benefit, needs to be explored before a change in practice.

POSTER PRESENTATION ABSTRACTS

Aim: To explore women's experiences and opinions of routine antenatal weighing, with women who had been weighed throughout their most recent pregnancy as part of a research study (the Body Composition in Pregnancy, BIP, Study).

Methods: At the end of the BIP Study, women were invited to participate in a semi-structured interview exploring their experiences and opinions of being weighed during pregnancy. Interviews were transcribed verbatim and analysed using a thematic analysis framework.

Results: Nine women, who had been weighed two to four times during pregnancy, were interviewed. The average age was 34.5 years and women were nine months post-partum; seven had a normal BMI and two were overweight, the mean BMI was 23.6 kg/m². Two themes were identified: 1. 'Weighing should be standard practice'; and 2. 'Weighing would serve multiple roles'-broken down into three subthemes: 'Increase awareness', 'Monitor progress', and 'Minimise postpartum weight retention'.

Conclusion: The women found being weighed during pregnancy a positive experience, verbalising several potential benefits of this practice. Contrary to previous suggestions, there was no evidence that being weighed during pregnancy caused anxiety.

References: 1 Allen-Walker V, Woodside J, Holmes V, Young I, Cupples ME, Hunter A, McKinley MC. Commentary on Routine weighing of women during pregnancy—is it time to change current practice?. BJOG 2015; DOI: 10.1111/1471-0528.13511.

SCOPE School London

14 - 15 June 2016

Charles Darwin House
London, UK

The theme of this SCOPE School is '**Advances in Diabetes & Obesity Management: Clinical Pathways**'

This will include topics from 'Bariatric surgery for diabetes, 'Nutritional/dietetic approaches to the obese diabetic' New diabetes drugs that are weight neutral or losing' and further interesting topics, panel discussions and case studies.

Our programme unites experts from across the world in addressing the assessment, treatment and prevention of obesity.

This intensive two day course covers the many features and varieties of obesity management that professionals encounter today. SCOPE School provides greater knowledge of effective patient management and of the vital role of professionals in tackling obesity. This event is SCOPE and CPD accredited.

Save the date!

Further details including the scientific programme, confirmed speakers and registration fees will be available online shortly.

Please contact scopeschool@worldobesity.org for further information.



For further information about World Obesity activities please contact:

World Obesity Federation
Charles Darwin 2, 107 Gray's Inn Road, London, WC1 X8TZ

Tel +44 (0)20 7685 2580

enquiries@worldobesity.org
www.worldobesity.org
Twitter: @WorldObesity

Registered Charity No. 1076981