

20th World Congress on Ultrasound in Obstetrics and Gynecology, 10–14 October 2010, Prague, Czech Republic: presentations and awards

IAN DONALD GOLD MEDAL

Presentation of the Ian Donald Gold Medal to Charles S. Kleinman

It was a tremendous honor to be asked to present the Ian Donald Gold Medal to Charles Kleinman this year, an honor that stems in part from the rarity with which this award is given by non-recipients; I very much appreciated being granted this unique opportunity based on the many years over which Charlie Kleinman and I worked together.

It is hard to know where to begin, so I will begin at the beginning. Charlie was born in Queens in New York City. At the age of 20 he graduated from New York University, where he had met his wife Jessica who came with him to Prague for this year's ISUOG meeting. He then went to New York Medical College, an institution perhaps not quite as well known as some other universities in the US, but that now has the distinction of being the alma mater of two Ian Donald Gold Medal recipients, the other being John Hobbins.

He did his residency at Cornell in New York and fellowship partly at Cornell, finishing at the Cardiovascular Research Institute of the University of California, San Francisco. At UCSF Charlie was fortunate to have the opportunity to work with the great Professor Abe Rudolph, as well as Michael Heyman, Norm Silverman and others, giving him the grounding in physiology that shaped his ability to teach physicians as well as patients and their families about fetal and neonatal cardiology.

Charlie came to Yale in 1977. Shortly after his arrival, John Hobbins came into his office with a large box full of M-mode recordings from fetuses and said, 'Charlie, do you think you can do anything with these?' From that came the first paper in the world to describe in English the clinical use of ultrasound for structural and rhythm diagnosis in the fetal heart¹.

This ground-breaking publication was followed a couple of years later by another classic paper, in *New England Journal of Medicine*². Since most people in ObGyn didn't read *Pediatrics*, and this was before the days of online tables of contents, the *New England Journal* paper was how many of us became aware of the field and the practice of fetal cardiology. For me, it was one of the things that made Yale the place to which I wanted to go for my fellowship in Maternal-Fetal Medicine, because of all that was developing there in ultrasound.

As many of you know, over the past 30 years Charlie has had occasional health problems. It has not slowed



Charles Kleinman (right) being presented with the 2010 Ian Donald Gold Medal by Joshua Copel

him down at all, and so he was able to attend ISUOG's meeting in person this year. We were not at all sure that he would be able to attend, however, so shortly after the voting on the Gold Medal, Ilan Timor, Larry Platt and I met in New York to present Charlie with the award. We did not have the actual medal there, so we gave him a letter notifying him and inviting him to come to Prague.

Charlie and I go back as far as 1983, but to understand his influence on the field of fetal cardiology, I should also mention some of the many others who came through Yale and came under his influence, working with him: Gianluigi Pilu, Greg DeVore, Ray Bahado-Singh, Giancarlo Mari, Alfred Abuhamad. All spent time working with Charlie at Yale, and have helped to form the field of fetal cardiology. We could run several courses in fetal cardiology for many days just for the graduates from Charlie's teaching at Yale.

Charlie left Yale about 15 years ago, worked in Florida for a time, and in 2002 returned to his beloved New York, where he has been productive at Columbia and, despite his ongoing health issues, he has shown his zest for life and his ability to enjoy himself and especially his family.

I am honored, on behalf of ISUOG, to present Charles Kleinman with the Ian Donald Gold Medal for 2010 in recognition of his tremendous contributions to the development of the use of ultrasound in fetal cardiology.

Joshua Copel

REFERENCES

1. Kleinman CS, Hobbins JC, Jaffe CC, Lynch DC, Talner NS. Echocardiographic studies of the human fetus: Prenatal diagnosis of congenital heart disease and cardiac dysrhythmias. *Pediatrics* 1980; 65: 1059–1067.
2. Kleinman CS, Donnerstein RL, DeVore GR, Jaffe CC, Lynch DC, Berkowitz RL, Talner NS, Hobbins JC. Fetal echocardiography for evaluation of *in utero* congestive heart failure. *N Engl J Med* 1982; 306: 568–575.

**FREE COMMUNICATION
ACKNOWLEDGMENTS**

The following free communications presented at the 20th World Congress on Ultrasound in Obstetrics and Gynecology are acknowledged as the best presentations in their categories. Full abstracts to these titles can be found in *Ultrasound in Obstetrics and Gynecology* 2010; 36 (Suppl. 1). We thank these authors for their valuable contributions to our scientific program.

Top five abstracts winner

Analysis of brain structure by MRI and neurodevelopment in preterm born infants with and without IUGR at 12–18 months of age (OC01.04, OC01.05)

M. Sanz-Cortes¹, N. Padilla¹, C. Falcon³, N. Bargallo³, F. Figueras¹, F. Botet², A. Arranz², E. Gratacós¹. ¹Fetal Medicine, Hospital Clinic Barcelona, Spain, Barcelona, Spain; ²Pediatrics, Hospital Clinic de Barcelona, Barcelona, Spain; ³Radiology Department, Hospital Clínic de Barcelona, Barcelona, Spain

Alfred Kratochwil award for best oral communication on 3D ultrasound

Intra- and interobserver agreement in the assessment of three-dimensional ultrasound volumes of adnexal masses using IOTA criteria (OC19.02)

P. Sladkevicius, L. I. Valentin. *Obstetrics and Gynecology, Lund University, Malmö, Sweden*

Young Investigator award winner

Vascular properties and vascular function at early school age following IUGR with abnormal fetal blood flow and very preterm birth (OC22.05)

E. K. Morsing², K. Marsal¹, J. Brodzki¹. ¹Department of Obstetrics and Gynecology, Lund University Hospital, Lund, Sweden; ²Neonatology, Lund University Hospital, Lund, Sweden

Best Oral Communications

The following oral communications were each selected as the best in their subject area. Selection was according to a combination of anonymous peer-review in advance of

the Congress and scores for presentation and/or scientific merit allocated on-site by a panel of judges.

General gynecology

Rectal deep endometriosis: transrectal approach with transvaginal probe to assess the infiltration of rectal mucosa (OC10.01)

C. Exacoustos, E. Zupi, B. Szabolcs, V. Romeo, C. Amoroso, M. Romanini, D. Arduini. *Department of Obstetrics and Gynecology, Università degli Studi di Roma "Tor Vergata", Rome, Italy*

Gynecology screening

Expectant management for sonographically benign cysts in asymptomatic premenopausal women: long term follow-up study (OC21.01)

J. Alcazar¹, B. Olartecoechea¹, S. Guerriero², S. Ajossa², G. Melis², M. Jurado¹. ¹Obstetrics and Gynecology, University of Navarra, Pamplona, Spain; ²Obstetrics and Gynaecology Department, University of Cagliari, Ospedale San Giovanni di Dio, Cagliari, Italy

Early pregnancy

Risk factors for tubal versus non-tubal ectopic pregnancies: a multicentre case series (OC04.03)

H.L. May-Miller¹, C. Bottomley², E. Kirk³, K. Hayes¹, C. Stalder³, D. Timmerman⁴, T. Bourne³. ¹Department of Obstetrics and Gynaecology, St. George's Hospital, University of London, London, United Kingdom; ²Department of Obstetrics and Gynaecology, Chelsea and Westminster Hospital, London, United Kingdom; ³Department of Obstetrics and Gynaecology, Imperial College London, Hammersmith Campus, London, United Kingdom; ⁴Department of Obstetrics and Gynaecology, University Hospitals, KU Leuven, Leuven, Belgium

Uterine pathology

Differentiation of uterine pathology by transvaginal elastography: preliminary results (OC08.01)

J. Veldman¹, C. Van Holsbeke¹, E. Werbrout¹, T. Bourne^{1,2}, D. Timmerman¹. ¹Department of Obstetrics & Gynecology, University Hospitals K.U. Leuven, Leuven, Belgium; ²Department of Obstetrics & Gynaecology, Imperial College London, Hammersmith Campus, London, United Kingdom

Reproductive medicine

Assessment of endometrial and subendometrial blood flow in women undergoing frozen embryo replacement and its relationship to conception (OC13.03)

A. Nandi, K. Jayaprakasan, J. Clewes, N. Raine-Fenning. *School of Clinical Sciences, Division of Human Development, University of Nottingham, Nottingham, United Kingdom*

Ovarian pathology

Ultrasound in diagnosis of new and recurrent borderline ovarian tumors (OC01.03)

D. Fischerova¹, D. Franchi², A. Testa³, L.I. Valentin⁴, L. Savelli⁵, A. Lissoni⁶, R. Fruscio⁶, C. Van Holsbeke^{10,7}, E. De Jonge⁷, S. VanHuffel⁸, T. Bourne^{10,9}, B. Van Calster⁸, F. Amant¹⁰, D. Timmerman¹⁰. ¹Department of Obstetrics and Gynecology, Oncogynecological Center, Charles University in Prague, First Faculty of Medicine and General University Hospital, Prague, Czech Republic; ²Dt.ssa Ginecologic Oncology Unit, Division of Gynecology, IEO, Milano, Italy; ³Istituto di Clinica Ostetrica e Ginecologica, Università Cattolica del Sacro Cuore, Rome, Italy; ⁴Department of Obstetrics and Gynecology, Lund University Hospital, Malmö, Sweden; ⁵Department of Obstetrics and Gynecology, Reproductive Medicine Unit, University Hospital of Bologna, Bologna, Italy; ⁶Clinica Ostetrica e Ginecologica, Ospedale S. Gerardo, Università di Milano, Monza, Italy; ⁷Obstetrics and Gynaecology Department, Ziekenhuis Oost-Limburg, Genk, Belgium; ⁸Department of Electrical Engineering, Katholieke Universiteit Leuven, University Hospitals, Leuven, Belgium; ⁹Department of Obstetrics and Gynecology, Imperial College London, London, United Kingdom; ¹⁰Department of Obstetrics and Gynecology, University Hospitals, Leuven, Belgium

Imaging in gynecological oncology

Ultrasound evaluation in preoperative assessment of extension of disease and prediction of optimal cytoreduction in ovarian cancer: a prospective trial (OC27.04)

A.C. Testa¹, M. Ludovisi¹, M. Malaggesi², A. Di Legge¹, F. Mascilini¹, M. Durante², I. Vercillo², B. Virgilio¹, G. Scambia¹, G. Ferrandina². ¹Gynecology, Università Cattolica del Sacro Cuore, Rome, Italy; ²Gynecology Department, Università Cattolica del Sacro Cuore, Campobasso, Italy

Pelvic floor

Association between transperineal ultrasound findings and anal incontinence in a follow-up study of anal sphincter tears (OC16.01)

D.V. Valsky, S.M. Cohen, M. Lipschuetz, B. Messing, R. Drai-Hassid, D. Hochner-Celnikier, S. Yagel. *Obstetrics and Gynecology, Hadassah-Hebrew University Medical Centers, Mt. Scopus, Jerusalem, Israel*

Screening for aneuploidy

Increased nuchal translucency and normal karyotype: perinatal and pediatric outcome at 2 years of age (OC06.05)

R. Mula¹, A. Goncè¹, M. Arigita¹, M. Bennàsar¹, F. Botet², A. Borrell¹, E. Gratacós¹. ¹Obstetrícia i Ginecologia, ICGON, Hospital Clínic de Barcelona, Barcelona, Spain; ²Neonatalogia ICGON., Hospital Clínic de Barcelona, Barcelona, Spain

Fetal cardiology

Fetal interrupted aortic arch: 2D-4D echocardiography, associations and outcome (OC02.03)

V. De Robertis¹, G. Rembouskos¹, G. Campobasso¹, A. Tempesta¹, N. Volpe², P. Volpe¹. ¹Fetal Medicine Unit Di Venere and Sarcone Hospitals, ASL BA, Bari, Italy; ²I Clinica Ostetrica e Ginecologica, Policlinico, University of Bari, Bari, Italy

Central nervous system

Early (15–20 week) ultrasound findings in type-2 cobblestone cortex lissencephaly (OC12.07)

A. Toi¹, K. Fong¹, D. Chitayat², P. Shannon⁴, S. Blaser³. ¹Medical Imaging, Mount Sinai Hospital, University of Toronto, Toronto, ON, Canada; ²Prenatal Diagnosis and Medical Genetics, Mount Sinai Hospital, University of Toronto, Toronto, ON, Canada; ³Neuroradiology, Hospital for Sick Children, University of Toronto, Toronto, ON, Canada; ⁴Neuropathology, Mount Sinai Hospital, University of Toronto, Toronto, ON, Canada

Multiple pregnancy

Incidence and clinical implications of unintended septostomy after fetoscopic laser therapy for twin–twin transfusion syndrome (OC07.05)

R. Cruz-Martinez¹, T. Van Mieghem², L. Lewi², E. Eixarch¹, J. Deprest², E. Gratacós¹. ¹Department of Maternal-Fetal Medicine, Hospital Clinic, Barcelona, Spain; ²Department of Obstetrics and Gynecology, University Hospitals Leuven, Leuven, Belgium

Fetal therapy

Childhood cardiac function following severe fetal red cell isoimmunization (OC20.05)

J.E. Dickinson^{1,3}, J. Sharpe², T. Warner³, E. Nathan³, L. D'Orsogna². ¹The University of Western Australia, Perth, WA, Australia; ²Children's Cardiac Centre, Princess Margaret Hospital for Children, Perth, WA, Australia; ³Women and Infants Research Foundation, Perth, WA, Australia

Fetal growth

Axonal loss and cognitive outcome at five years in term small-for-gestational age infants with normal umbilical artery (OC01.06)

D. Oros^{1,4}, S. Valle^{3,4}, H. Tuquet⁴, V. Pueyo^{2,4}, N. Güerri^{2,4}, P. Ventura^{3,4}. ¹Obstetrics Department, Hospital Clínico Universitario Zaragoza, Zaragoza, Spain; ²Ophthalmology, Hospital Universitario Miguel Servet, Zaragoza, Spain; ³Pediatrics, Hospital Clínico Universitario Zaragoza, Zaragoza, Spain; ⁴Psychology, Aragon Health Science Institute, Zaragoza, Spain

Fetal anomalies

Maxillary protrusion in fetuses with facial clefts, measured with the MNM angle (OC24.03)

E. de Jong-Pleij¹, L.R. Pistorius², L.S. Ribbert¹, E. Tromp¹, C.M. Bilardo³. ¹St. Antonius Hospital, Utrecht, Netherlands; ²University Medical Centre Utrecht, Utrecht, Netherlands; ³University Medical Centre Groningen, Groningen, Netherlands

Obstetric management

A new method for prediction of preterm birth (PTB): fetal zone enlargement (OC17.03)

O.M. Turan¹, S. Turan¹, E.F. Funai², I. Buhimschi², C. Harman¹, J. Copel², A. Baschat¹. ¹Department of Ob/Gyn and Reproductive Sciences, University of Maryland, Baltimore, MD, USA; ²Department of Ob/Gyn and Reproductive Sciences, Yale University School of Medicine, New Haven, CT, USA

Imaging technologies

Placental and fetal oxygenation assessment in a rat model of intrauterine growth restriction with BOLD contrast in MRI (OC11.01)

A. Sabine^{1,2}, B. Deloison^{1,2}, S. Nathalie^{2,3}, C. Charles-Andre^{2,3}, Y. Ville^{1,2}, C. Olivier^{2,3}, L.J. Salomon^{1,2}. ¹Assistance Publique-Hôpitaux de Paris, Hôpital Necker Enfants Malades, Paris, France; ²INSERM, U970, Paris Cardiovascular Research Center - PARCC, Paris, France; ³Assistance Publique-Hôpitaux de Paris, Hôpital Européen Georges Pompidou, Paris, France

SPIO-enhanced MR imaging study of placental perfusion in a rat model of intrauterine growth restriction (OC11.02)

B. Deloison^{1,2}, S. Aimot^{1,2}, N. Siauue^{2,4}, D. Balvay^{2,3}, R. Thiam^{2,3}, C. Cuenod^{2,4}, Y. Ville^{1,3}, O. Clement^{2,4}, L.J. Salomon^{1,2}. ¹Assistance Publique-Hôpitaux de Paris, Hôpital Necker Enfants Malades, Paris, France; ²INSERM, U970, Paris Cardiovascular Research Center - PARCC, Paris, France; ³Université Paris Descartes, UMR-S970, Paris, France; ⁴Assistance Publique-Hôpitaux de Paris, Hôpital Européen Georges Pompidou, Paris, France

Maternal fetal Doppler

High-amplitude inspiratory movement in the fetus obstructs the inferior vena cava (IVC) enhancing upper body gas transport (OC18.02)

M.K. Nyberg¹, S.L. Johnsen², T. Kiserud^{1,2}. ¹University of Bergen, Bergen, Norway; ²Haukeland University Hospital, Bergen, Norway

Best Short Oral Presentations (oral posters)

The following short oral presentations were each selected as the best in their subject area. Selection was according to a combination of anonymous peer-review in advance of the Congress and scores for presentation and/or scientific merit allocated on-site by a panel of judges.

General gynecology

Prediction of the need for morcellation at total laparoscopic hysterectomy (TLH) from pre-operative 3D volumetric ultrasound-estimated uterine weight and parity (OP11.03)

M. Mongelli, I.V. Casikar, J. Riemke, S. Reid, D. Alhamdan, T. Bignardi, G. Condous. *Early Pregnancy, Acute Gynaecology and Advanced Endosurgery Unit, Nepean Hospital, Penrith, NSW, Australia*

Gynecology screening

The normal width of the uterine cavity: does it vary with age, gravidity and parity? (OP35.01)

B.R. Benacerraf^{1,2}, T.D. Shipp^{1,2}, J. Lyons^{1,2}, B. Bromley^{1,2}. ¹Harvard Medical School, Boston, MA, USA; ²Brigham and Women's Hospital, Boston, MA, USA

Early pregnancy

Can we avoid laparoscopy in most ectopic pregnancies? The experience of our Early Pregnancy Unit (OP02.08)

D. Alhamdan¹, T. Bignardi¹, J. Riemke¹, I.V. Casikar¹, S. Reid¹, M. Mongelli², G. Condous¹. ¹Acute Gynaecology, Early Pregnancy and Advanced Endosurgery Unit, Nepean Clinical School, University of Sydney, Sydney, NSW, Australia; ²Women and Children's Health, Nepean Clinical School, Penrith, NSW, Australia

Uterine pathology

Focused ultrasound surgery for conservative fibroids treatment (OP07.10)

H.M. Marret¹, A. Bleuzen³, F. Patat², F. Tranquart³. ¹Gynécologie, CHU Bretonneau, Tours Cedex 1, France; ²CIT 806 Ultrasons Radiopharmaceutiques, Inserm-CHRU de Tours, Tours, France; ³Ultrasons, Pole d'imagerie CHU Bretonneau, Tours, France

Reproductive medicine

Assessing the reliability and validity of 3D crown-rump length measurements (OP16.02)

S. Sur, K. Jayaprakasan, M. Batcha, C. Voltolina, J. Clewes, B. Winter, N. Cash, N. Raine-Fenning. *NURTURE, University of Nottingham, Nottingham, United Kingdom*

Ovarian pathology

Sonographic follow-up of unilocular > 5 cm and multilocular ovarian cysts < 7 cm in post-menopausal women: preliminary results (OP21.05)

F. Leone, A. Crepaldi, G. Tosi, C. Marciante, I. Cetin. *Department of Obstetrics & Gynecology, DSC L. Sacco, University of Milan, Milan, Italy*

Imaging in gynecological oncology

Ultrasound characteristics of non-genital abdomino-pelvic tumors (OP31.06)

M. Zikan, D. Fischerova, I. Pinkavova, D. Cibula. *Oncogynecologic Center, Department of Obstetrics and Gynecology, Charles University - First Faculty of Medicine, Prague, Czech Republic*

Pelvic floor

Unexpectedly high levator avulsion rates in a tertiary referral urogynecological service (OP26.10)

V.H. Eisenberg, M. Alcalay, A. Jakobson-Setton, R. Achiron, E. Schiff. *Obstetrics and Gynecology, Sheba Medical Center, Ramat Gan, Israel*

Screening for aneuploidy

Variability of ultrasound measurements with different machine/probe combinations assessed using a phantom: implications for NT screening (OP17.04)

R.G. Axell¹, C. Lynch², T. Chudleigh³, J. Mangat¹, P. White¹, C. Lees². ¹Clinical Engineering Department, Cambridge University Hospitals NHS Foundation Trust, Cambridge, United Kingdom; ²Fetal Medicine Unit, Cambridge University Hospitals NHS Foundation Trust, Cambridge, United Kingdom; ³Rosie Ultrasound Department, Cambridge University Hospitals NHS Foundation Trust, Cambridge, United Kingdom

Fetal cardiology

Learning curve and factors influencing the feasibility of performing fetal echocardiography at the time of the first trimester scan (OP03.06)

R.S. Abu-Rustum¹, M. Ziade², S.E. Abu-Rustum³. ¹Center For Advanced Fetal Care, Tripoli, Lebanon; ²Lebanese University, Tripoli, Lebanon; ³Dept. of Ob/Gyn, Nini Hospital, Tripoli, Lebanon

Central nervous system

How accurate is the offline analysis of 3D volume datasets in the diagnosis of fetal brain abnormalities? (OP25.01)

M. Salman^{1,2}, H. Mousa¹, P. Twining¹, D.K. James¹, M. Momtaz², M. Aboulghar², A. el-Sheikhah², G.J. Bugg¹. ¹Nottingham University Hospitals NHS Trust, Nottingham, United Kingdom; ²Cairo University Hospitals Fetal Medicine Unit, Cairo, Egypt

Multiple pregnancy

Impact of selective laser photocoagulation for twin-twin transfusion syndrome on myocardial deformation: strain and strain rate in the donor and recipient (OP06.09)

S. Zeng¹, Z. Tian¹, M. Bebbington², M. Johnson², J. Rychik¹. ¹Fetal Heart Program, The Children's Hospital of Philadelphia, Philadelphia, PA, USA; ²Center for Fetal Diagnosis and Treatment, The Children's Hospital of Philadelphia, Philadelphia, PA, USA

Fetal therapy

Intrauterine transfusion (IUT) of mesenchymal stem cells in two fetuses with fractures: follow-up to 3 and 4 years of age (OP27.07)

M. Yamamoto^{1,2}, P. Conget³, T. Anguita², C. Allers³, E. Testart², S. Castillo², C. Gothestrom⁴, K. Le Blanc⁴, C. Crain⁵, A. Insunza^{1,2}. ¹Hospital Padre Hurtado, Facultad de Medicina CAS-UDD, Santiago, Chile; ²Clínica Aleman de Santiago, Facultad de Medicina CAS-UDD, Santiago, Chile; ³Unidad de Investigación, Facultad de Medicina CAS-UDD, Santiago, Chile; ⁴Karolinska Institutet, Stockholm, Switzerland; ⁵DNA Matrix Diagnostics, Tulane University, New Orleans, LA, USA

Fetal growth

Cardiovascular parameters in the prediction of mortality in early-onset intrauterine growth restriction (OP01.06)

M.C. Cruz Lemini¹, R. Cruz-Martinez¹, T. Van Mieghem², M. Parra-Cordero³, J. Deprest², F. Crispi¹, E. Gratacós¹. ¹Department of Maternal-Fetal Medicine (ICGON), Hospital Clínic, University of Barcelona, Barcelona, Spain; ²Fetal Diagnosis and Therapy Unit, University Hospitals Leuven, Leuven, Belgium; ³Fetal Medicine Unit, Hospital Clínico Universidad de Chile, Santiago, Chile

Fetal anomalies

Sonographic estimation of fetal head circumference - how accurate are we? (OP18.01)

N. Melamed, A. Ben-Haroush, Y. Yogev, R. Mashiach, I. Meizner. Rabin Medical Center, Petach-Tikva, Israel

Placental pathology

Screening for placenta accreta by ultrasound in the first trimester (OP30.03)

J. Stirnemann, S. Forner, J. Bernard, Y. Ville. *Obstetrics and Fetal Medicine, GHU Necker-Enfants Malades, University Paris Descartes, Paris, France*

Obstetric management

Outcome of patients with short cervico-isthmic distance (cervist) at first trimester (OP13.03)

L.J. Salomon, J. Stirnemann, M. Essaoui, E. Spaggiari, J. Bernard, Y. Ville. *Maternité Necker, Université Paris Descartes. AP-HP, Paris, France*

Imaging technologies

Comparison of nuchal translucency measurements using 3D Auto biometry package-NT, 2D and 3D ultrasound (OP20.03)

H. Cho¹, Y. Park¹, Y. Kim¹, K. Lee², J. Kim², S. Kim², J. Kwon¹. ¹Yonsei University Health System, Seoul, Republic of Korea; ²Medison Research and Development Center, Seoul, Republic of Korea

Maternal fetal Doppler

Venous liver blood flow and regulation of human fetal growth: evidence from macrosomic fetuses (OP24.03)

J. Kessler^{1,2}, S. Rasmussen^{1,2}, K. Godfrey³, M. Hanson³, T. Kiserud^{1,2}. ¹Department of Obstetrics and Gynecology, Haukeland University Hospital, Bergen, Norway; ²Institute of Clinical Medicine, University of Bergen, Bergen, Norway; ³University of Southampton, Southampton, United Kingdom