AIPE
Associazione
Italiana
PreEclampsia

Conference Proceedings of AIPE National Congress Florence, March 5th-7th, 2024

Vol. 36 - Supplement N. 1
ISSN 2385 - 0868

edra

SIGO
SOCIETA' ITALIANA
DI GINECOLOGIA E OSTETRICIA

Italian Journal
of
Gynæcology & Obstetrics

The Official Journal of the
Società Italiana di Ginecologia e Ostetricia
(SIGO)

Conference Proceedings of AIPE National Congress Florence, March 5th-7th, 2024

The abstracts contained in this Supplement were evaluated and accepted by the Organizing Committee, without formal external peer review by the Journal's Editor/Reviewers

*Note that the asterisk after author's surname states the Corresponding author in each abstract

Association between plasma HLA-DR$^+$ placental vesicles and preeclampsia: a pilot longitudinal cohort study

Marianna **Onori** [1], Rita **Franco** [2], Silvio **Tartaglia** [2], Silvia **Buongiorno** [2], Giuliana **Beneduce** [1], Fabio **Sannino** [1], Nicoletta **Di Simone** [3,4], Giovanni **Scambia** [1,2], Antonio **Lanzone** [1,2], Chiara **Tersigni** [2,*]

[1] Università Cattolica del Sacro Cuore, Rome, Italy.
[2] Fondazione Policlinico Universitario A. Gemelli IRCCS, Rome, Italy.
[3] Department of Biomedical Sciences, Humanitas University, Milan, Italy.
[4] IRCCS Humanitas Research Hospital, Milan, Italy.

DOI: 10.36129/jog.2024.S01

Objective. Reduced maternal-foetal immunological tolerance is a possible trigger of poor placentation and preeclampsia (PE). To allow foetal immunological escape from the semi-allogenic mother, there is a complete suppression of Human Leukocyte Antigens (HLA) class II in the human placenta. Aberrant expression of the antigen HLA-DR has been observed in the syncytiotrophoblast of PE patients. Aim of this study was to analyse plasma levels of HLA-DR$^+$ syncytiotrophoblast-derived extracellular vesicles (STEVs) during the three trimesters of pregnancy in relation to the subsequent onset of PE.

Materials and Methods. Pregnant women, recruited during the first trimester screening, underwent venous blood sampling during the three trimesters of pregnancy. STEVs were collected from plasma via ultracentrifugation (120,000 g) and characterized by Western blot, nanotracking analysis and flow cytometry for the expression of placental alkaline phosphatase (PLAP), a marker of placental derivation, and HLA-DR. Clinical and laboratory data were analysed using Student's T test or Mann-Whitney U test, according to types of variables.

Results. Out of 107 women recruited, 10 developed PE. STEVs were detected in all three trimesters of pregnancy with a zenith in the second trimester. Significantly higher plasma levels of HLA-DR$^+$ STEVs were found in the PE group compared to the no-PE group during all three trimesters of pregnancy.

Conclusions. More research is needed to investigate the possible role of HLA-DR+STEVs as circulating early biomarkers of PE.

A case report of atypical haemolytic-uremic syndrome (aHUS) in a patient with type IIB von Willebrand disease (VWD): management and differential diagnosis of thrombotic microangiopathies (TMA) disorders in pregnancy

Eleonora **Romani** [1,*], Sara **Zullino** [2], Laura **Angeli** [2], Serena **Ottanelli** [2], Caterina **Serena** [2], Serena **Simeone** [2], Marianna Pina **Rambaldi** [2], Giacomo **Bruscoli** [2], Felice **Petraglia** [1], Federico **Mecacci** [1,2]

[1] Obstetrics and Gynaecology Unit, Department of Experimental and Clinical Biomedical Sciences, University of Florence, Florence, Italy.

[2] High Risk Pregnancy Unit, Department for Women and Children Health, Careggi University Hospital, Florence, Italy.

DOI: 10.36129/jog.2024.S02

Objective. TMA disorders in pregnancy and postpartum (thrombotic thrombocytopenic purpura, aHUS and haemolysis-elevated liver enzymes-low platelets, syndrome -HELLP-) are characterized by partly overlapping clinical and laboratory features: microangiopathic haemolytic anaemia, thrombocytopenia and organ injury. While differential diagnosis is not always obvious, these conditions require different management.

Materials and Methods. A 48-years-old woman affected by type IIB VWD showed reduced platelet count, mild anaemia and haemolysis, initial liver and renal damage at 33+6 weeks of her medically assisted dichorionic-diamniotic twin pregnancy complicated by foetal growth restriction of both foetuses. Caesarean section was performed for maternal indication. On first postoperative day patient showed new onset hypertension, severe haemolysis (LDH > 1,000 U/L; LDH/AST > 10), severe thrombocytopenia (12,000/μl), anaemia (8.4 g/dl) and high creatinine levels (1.74 mg/dL) suggesting a TMA disorder.

Results. Negative direct Coombs test, low C3, C4 and haptoglobin levels, schistocytes on peripheral blood smear, ADAMTS13 activity > 10% led to the final diagnosis of aHUS, treated with Eculizumab, a complement blockade, with progressive resolution of the clinical features.

Conclusions. TMA are rare but severe disorders of pregnancy and postpartum. In this case VWD hampered the diagnosis, as it itself causes thrombocytopenia. In such critical cases a systematic and multidisciplinary team approach (nephrology, haematology, obstetrics, anaesthesiologist) is recommended to avoid delays in differential diagnosis and in treatment that may be life-threatening.

Management and obstetric outcomes in pregnancies complicated by systemic lupus erythematosus nephritis

Chiara **Biagiotti** [1,*], Caterina **Serena** [2], Giulia **Lemmi** [1], Silvia **Giovinale** [1,2], Silvia **Vannucccini** [1,2], Serena **Simeone** [2], Giacomo **Bruscoli** [2], Serena **Ottanelli** [2], Sara **Zullino** [2], Laura **Angeli** [2], Marianna Pina **Rambaldi** [2], Felice **Petraglia** [1], Federico **Mecacci** [1,2]

[1] Obstetrics and Gynaecology Unit, Department of Experimental and Clinical Biomedical Sciences, University of Florence, Florence, Italy.
[2] High Risk Pregnancy Unit, Department for Women and Children Health, Careggi University Hospital, Florence, Italy.

DOI: 10.36129/jog.2024.S03

Objective. Systemic lupus erythematosus (SLE) predominantly affects women in childbearing age. Pregnancy complicated by SLE is associated with a 2-4 fourfold increased rate of obstetric complications, including foetal growth restriction (FGR) and preeclampsia (PE).

Lupus nephritis (LN) and active disease at conception stand as main risk factors for adverse obstetric outcome. The aim of the study is to compare pregnancy outcomes in patients with and without LN, provided a multidisciplinary approach and a broad prophylaxis protocol.

Materials and Methods. Cohort study on 157 SLE pregnancies referred to a Tertiary Centre, from 2007 to 2022.

Results. A cohort of 157 pregnancies was divided into two groups according to renal involvement: 40 with pre-existing LN and 117 without LN.

The LN group more frequently carried antiphospholipid (55% *vs* 36.8%, $p = 0.04$) and anti-DNA antibodies (60% *vs* 23%, $p < 0.001$), creatinine > 1.2 mg/dl (12.8% *vs* 2.9%, $p = 0.03$), pre-existing hypertension (35.9% *vs* 8.6% $p < 0.001$) and proteinuria (52.5% *vs* 4.3%, $p < 0.001$). No difference was found in terms of active disease.

97.4% of LN group received a prophylactic treatment, of which 56.4% with a combination of low-dose aspirin and low molecular weight heparin. In LN group, the incidence of preeclampsia and FGR was higher than in control group (10.2% *vs* 1.04%, $p = 0.03$).

Conclusions. A planned pregnancy managed with a multidisciplinary approach with a broad prophylactic treatment may prevent most adverse obstetric outcomes in women with LN but does not seem to be effective on the prevention of PE and FGR.

Correlation between insulin resistance and hypertensive disorders in pregnant women: a focus on preeclampsia in Italian population

Martina **Mirabella** [1,*], Sascia **Moresi** [2], Federica **Totaro Aprile** [1], Giorgia **Zenobio** [2], Silvia **Buongiorno** [2], Roberta **Rullo** [2], Francesca **Stollagli** [2], Stefano **Fruci** [2], Silvia **Salvi** [1,2], Sergio **Ferrazzani** [1], Antonio **Lanzone** [1,2]

[1] Department of Life Sciences and Public Health, Università Cattolica del Sacro Cuore, Rome, Italy.
[2] Department of Women's and Child Health and Public Health Sciences, Fondazione Policlinico Agostino Gemelli, IRCSS, Rome, Italy.

DOI: 10.36129/jog.2024.S04

Objective. Aim of our study was to define the role of maternal insulin abnormal metabolism in the pathogenesis of hypertensive disorders of pregnancy (HDP) following our previous observation of a lack of insulin-resistance in preeclampsia (PE) of Italian patients.

Materials and Methods. An observational study was conducted on 74 pregnant women affected by HDP. Control group was constituted by 20 healthy women with uncomplicated pregnancy. Fasting insulin, HOMA-IR and QUICKI index score were adopted to measure insulin resistance in both groups.

Results. Before 34 weeks, no significant differences were observed in fasting insulin, HOMA-IR, and QUICKI index either among different types of HDP or between women affected by HPD and controls. After 34 weeks, women with chronic hypertension compared to controls showed significantly higher levels of fasting insulin, HOMA-IR and QUICKI index (15.47 μUI/ml *vs* 7.97 μUI/ml, p = 0.02; 2.24 *vs* 1.39, p = 0.012; 0.34 *vs* 0.38, p = 0.04). No other differences were found. No differences in insulin-resistance were detected between women with PE and controls and between women with early and late-onset PE.

Conclusions. Hyperinsulinemia and insulin resistance are not features of late-onset preeclampsia in our patients suggesting a different pathogenetic pathways. These findings support the idea of a particular pattern of PE in our country, suggesting a pathogenetic complexity of PE in the various countries.

Hypertensive disorder in renal transplant pregnancies: a single centre cohort study

Stefano **Fruci** [1,*], Federica **Totaro Aprile** [2], Giorgia **Zenobio** [1], Francesca **Stollagli** [1], Roberta **Rullo** [1], Silvia **Buongiorno** [1], Sascia **Moresi** [1], Silvia **Salvi** [1,2], Sergio **Ferrazzani** [1,2], Antonio **Lanzone** [1,2]

[1] Department of Women's and Child Health and Public Health Sciences, Fondazione Policlinico Agostino Gemelli, IRCSS, Rome, Italy.
[2] Department of Life Sciences and Public Health, Università Cattolica del Sacro Cuore, Rome, Italy.

DOI: 10.36129/jog.2024.S05

Objective. Aim of our study is to describe perinatal outcome in a cohort of women with kidney transplant with particular emphasis on hypertensive disorder.

Materials and Methods. We retrospectively collected maternal and neonatal data of pregnant women, admitted since 2020 to our Obstetric Pathology Unit, who received kidney transplant within 3 years before conception.

Results. Nine singleton pregnancies were gathered; mean maternal age was 35 years with a mean pre-conceptional body mass index of 23.8 kg/m^2 and gestational weight gain of 13 kg. One third of women suffered of chronic anaemia. During pregnancy, creatinine serum level ranged from 1.1 ± 0.4 to 1.3 ± 0.5 mg/dL. Four women suffered of chronic hypertension. Gestational hypertension complicated four pregnancies; no pregnancy was complicated by preeclampsia. In our series, only one woman did not show hypertension; 8 of 9 women had caesarean section.

Late intrauterine growth restriction complicated 3 of 9 pregnancies. One third of pregnancies ended with preterm delivery. Mean gestational age of delivery was 36.9 ± 0.9 weeks; regarding neonatal outcome, mean birthweight was of 2,593.3 ± 460.5 g and neonatal birth percentile of 25.6 ± 24.1. 4 of 9 neonates were small for gestational age.

Conclusions. Our data confirm that pregnancy after renal transplant confers significant risk in terms of maternal and foetal adverse events, including increased rates of hypertensive disorders and caesarean section. The risk of low birth rate and preterm birth is also high.

A case of delayed postpartum eclampsia

Maria Teresa **Martini** [1,*], Sara **Zullino** [2], Laura **Angeli** [2], Serena **Ottanelli** [2], Marianna Pina **Rambaldi** [2], Caterina **Serena** [2], Serena **Simeone** [2], Giacomo **Bruscoli** [2], Felice **Petraglia** [1], Federico **Mecacci** [1,2]

[1] Obstetrics and Gynaecology Unit, Department of Experimental and Clinical Biomedical Sciences, University of Florence, Florence, Italy.

[2] High Risk Pregnancy Unit, Department for Women and Children Health, Careggi University Hospital, Florence, Italy.

DOI: 10.36129/jog.2024.S06

Background. Delayed postpartum eclampsia is the occurrence of one or more seizures from 48 h to 6 weeks after delivery in a woman with signs and/or symptoms of preeclampsia. We describe an atypical case of delayed eclampsia.

Case presentation. Data were collected from hospital medical records and telephone interview.

A 39-year-old woman was admitted to the Emergency Department, University Hospital of Careggi, Florence, with headache not responsive to pharmacologic treatment, blurred vision and new onset hypertension ten days after delivery.

Pregnancy had been complicated by gestational diabetes and she had performed a planned caesarean section for previous uterine surgery.

After her arrival she had seizures. Antihypertensive and antiepileptic drugs were administrated and blood tests, computed tomography (CT), electrocardiogram, magnetic resonance imaging (MRI), electroencephalography and supra-aortic trunk ultrasound were performed. Blood tests showed no abnormality. CT suggested the occurrence of an adrenal mass suspicious for pheochromocytoma and MRI demonstrated PRESS (Posterior Reversible Encephalopathy Syndrome).

After 20 days of hospitalization in stroke unit, the patient was discharged with antihypertensive and anticonvulsant therapy. Excluding other differential diagnoses, in particular pheochromocytoma, postpartum eclampsia was confirmed also at 6 months. At 5 years follow-up, the patient shows no neurological sequelae and no cardiovascular, renal or hepatic impairment.

Conclusions. Eclampsia should be suspected in all cases of seizures up to 6 weeks after delivery. Prompt and proper differential diagnosis, combined with an appropriate treatment, can prevent adverse outcomes. Accurate counselling on the risks associated with future pregnancies and on cardiovascular long-life risks is mandatory.

The prognostic value of extremely high sFlt-1/PLGF in the progression of early onset severe preeclampsia

Mirko **Pozzoni** *, Serena **Girardelli**, Federica **Pasi**, Paolo Ivo **Cavoretto**, Massimo **Candiani**, Maddalena **Smid**

Department of Obstetrics and Gynecology, IRCCS San Raffaele Scientific Institute, Milan, Italy.

DOI: 10.36129/jog.2024.S07

Background. To describe a case of severe preeclampsia where the finding of an extremely high sFlt-1/PLGF ratio correlated with fast disease progression.

Case presentation. We reviewed the case of a 36-year-old nulliparous patient with a spontaneous pregnancy and no preeclampsia screening during first trimester CST. She accessed our triage at 28 gw for diarrhoea; a casual diagnosis of oligohydramnios was performed (negative PAMG-1).

Results. A scan revealed stage 1 IUGR (EFW 650 g), increased uterine artery Doppler and normal foetal Doppler. The placenta appeared uneven with hypoechoic areas. Following an increase in her blood pressure, she was started on nifedipine 20 mg TID and underwent steroids for lung maturity. sFlt-1/PLGF ratio was 1,295, and 24-hour urinary protein was 1.523 g. Two days after admission, she developed oliguria and complained of breathing difficulties. A transthoracic echo revealed normal intravascular volume with a bilateral pleural effusion; this deteriorated in the following days along with a further increase in anti-hypertensive medication. EMCS was performed one week after admission for derangement of maternal conditions. A female baby (690 g) was successfully delivered, APGAR 7-9, arterial pH 7.24 with BE -6. Anti-hypertensive treatment was gradually decreased after EMCS, discharge occurred after 7 days. Pathology revealed a 4cm retroplacental haematoma and maternal-vascular-malperfusion (MVM).

Conclusions. This is an emblematic case of the correlation between an extremely high sFlt1/PLGF ratio, preeclampsia with an exponential clinical derangement and severe placental alterations. sFlt-1/PLGF is validated as a negative predictive tool, yet prospective studies on the prognostic role of sFlt-1/PLGF would be extremely useful to correctly manage patients with early onset preeclampsia.

First trimester haemodynamic profiles in pregnant women at high- and low- risk for preeclampsia

Anna Luna **Tramontano** [1,*], Antonio **Angelino** [2], Marika Ylenia **Rovetto** [2], Giuliana **Orlandi** [2], Giulio **De Piano** [2], Sara **Mannolini** [2], Claudia **Di Filippo** [2], Pasquale **Milo** [2], Raffaele **Riccardi** [2], Laura Letizia **Mazzarelli** [2], Maurizio **Guida** [1], Giuseppe Maria **Maruotti** [2], Laura **Sarno** [1]

[1] Department of Neurosciences, Reproductive Science, University of Naples Federico II, Naples, Italy.
[2] Department of Public Health, University of Naples Federico II, Naples, Italy.

DOI: 10.36129/jog.2024.S08

Objective. The aim of our study was to evaluate maternal haemodynamic profile assessed by USCOM in women resulted at high and low risk for preeclampsia (PE) at first trimester screening.

Materials and Methods. This was a prospective monocentric observational study analysing maternal haemodynamic profile assessed by USCOM in 459 pregnant women at the time of first trimester screening for preeclampsia.

Continuous variables were compared using t-test student, while the chi-square or Fisher's test were used for categorical variables. A P-value of < 0.05 was considered statistically significant.

Results. In our cohort, 123 women reported a high-risk result (26.8%). Out of them, 21.9% developed PE and only the 2.2% of low-risk women did. Heart Rate (HR) (83.62 ± 15.43 *vs* 87.24 ± 19.24; p = 0.045), Systemic Vascular Resistance Index (SVRI) (3,208.07 ± 1,270.97 *vs* 3,681.32 ± 1,808; p = 0.010), Systemic Vascular Resistance Index (SVR) z-score (1.79 ± 1.48 *vs* 2.27 ± 1.35; p = 0.001) and Potential Kinetic Ratio (PKR) (81.29 ± 45.52 *vs* 92.91 ± 53.41; p = 0.036) were significantly higher in high-risk women compared to low-risk group. Otherwise, Stroke Volume (SV) and Stroke Volume Index (SVI) are both higher in low risk resulted women (46.96 ± 14.68 *vs* 44.19 ± 15.30; p = 0.047 and 26.81 ± 8.32; $p \leq 0.001$, respectively).

Conclusions. Pregnant women classified as low and high risk at first trimester screening for PE reported two different maternal haemodynamic profile. According to our results, in high-risk women, an unfavourable haemodynamic profile could be highlighted in the first trimester. Further studies can lead to the introduction of USCOM markers in a more complex predictive model of PE.

Obesity and hypertensive disorders in pregnancy: correlation with small for gestational age/foetal growth restriction

Laura **Marinelli** [1,*], Virginia **Manzi** [1], Laura **Angeli** [2], Sara **Zullino** [2], Giacomo **Bruscoli** [2], Serena **Ottanelli** [2], Marianna Pina **Rambaldi** [2], Caterina **Serena** [2], Serena **Simeone** [2], Silvia **Vannuccini** [1], Felice **Petraglia** [1], Federico **Mecacci** [1,2]

[1] Obstetrics and Gynaecology Unit, Department of Experimental and Clinical Biomedical Sciences, University of Florence, Florence, Italy.

[2] High Risk Pregnancy Unit, Department for Women and Children Health, Careggi University Hospital, Florence, Italy.

DOI: 10.36129/jog.2024.S09

Objective. Literature suggests that systemic inflammation linked to obesity (BMI ≥ 30) impacts on placentation, increasing the risk of Hypertensive Disorders of Pregnancy (HDP). The aim of our study was to further investigate this known correlation, analysing the relationship between obesity and Small for Gestational Age (SGA) or Foetal Growth Restriction (FGR) in a cohort of obese patients with pregnancy complicated by HDP.

Materials and Methods. This observational cohort study included single pregnancies complicated by maternal pre-existing obesity who developed HDP and who delivered at Careggi University Hospital between January 2017 and December 2023. Women with pre-gestational chronic diseases were excluded. Data regarding age, parity, smoke habit, pre-gestational BMI, uterine arteries Doppler velocimetry, prophylaxis with acetylsalicylic acid, gestational diabetes, HDP and neonatal weight were recorded. Multinomial logistic regression analysis was performed to verify the impact of these known risk factors for FGR/SGA in the study population.

Results. A total of 88 women were enrolled; mean BMI was 34.1 (±4.15 SD); 22/88 patients delivered foetuses affected by SGA/FGR (25%). Only BMI showed a significant correlation with the incidence of FGR/SGA ($p = 0.008$). Furthermore, comparing different BMI classes, it was observed that the incidence of FGR/SGA is higher for classes II and III than for class I ($p = 0.037$).

Conclusions. Our findings highlight the key role of maternal BMI as an independent risk factor for FGR/SGA, overall in cases of severe obesity (BMI ≥ 35, class II/III).

First trimester USCOM assessment for the prediction of hypertensive disorders during pregnancy

Marika Ylenia **Rovetto** [1,*], Giuliana **Orlandi** [2], Antonio **Angelino** [1], Anna Luna **Tramontano** [2], Concetta **De Simone** [1], Antonietta **D'Onofrio** [1], Chiara **Murolo** [1], Giulio **De Piano** [1], Luigi **Carbone** [2], Laura Letizia **Mazzarelli** [1], Laura **Sarno** [2], Giuseppe Maria **Maruotti** [1]

[1] Department of Public Health, University of Naples Federico II, Naples, Italy.
[2] Department of Neurosciences, Reproductive Science, University of Naples Federico II, Naples, Italy.

DOI: 10.36129/jog.2024.S10

Objective. The maternal cardiovascular system adapts to pregnancy through complex physiological mechanisms. The aim of this study was to evaluate if the maternal haemodynamic assessment in normotensive women in the first trimester of pregnancy was predictive for the occurrence of hypertensive disorders during pregnancy.

Materials and Methods. This retrospective observational study included 329 healthy women underwent UltraSonic Cardiac Output Monitor (USCOM) to detect haemodynamic parameters during the screening for nuchal translucency at 11 to 14 weeks of gestation at the Prenatal Diagnosis Centre of the University of Naples Federico II from January 2022 to December 2023. Patients were followed until term, noting the appearance of hypertensive disorders and/or intrauterine growth restriction.

Results. 306 patients had an uneventful pregnancy (controls), while 23 (7.5%) developed hypertensive disorders (cases). USCOM showed higher systemic vascular resistance index, lower peak velocity of flow and higher potential to kinetic energy ratio in cases compared to controls (3,994.2 ± 1,175.3 *vs* 3,233.2 ± 1,373.7 dynes × s/cm^{5}m^2, $p < 0.019$; 0.8 ± 0.3 *vs* 0.9 ± 0.2 m/s, $p < 0.004$; 108.5 ± 53.3 *vs* 81.4 ± 45.2, $p < 0.019$, respectively).

Conclusions. Maternal haemodynamic assessment in the first trimester of pregnancy can identify early markers of altered cardiovascular adaptation that may lead to the development of hypertensive disorders in the third trimester of pregnancy.

Association between prolonged second stage of labour, hypertensive disorder of pregnancy and major postpartum haemorrhage

Angela **Gallone** [1,*], Benedetta **Baggio** [1], Laura **Angeli** [2], Sara **Zullino** [2], Serena **Ottanelli** [2], Mariannna Pina **Rambaldi** [2], Caterina **Serena** [2], Giacomo **Bruscoli** [2], Felice **Petraglia** [1], Federico **Mecacci** [2]

[1] Obstetrics and Gynaecology Unit, Department of Experimental and Clinical Biomedical Sciences, University of Florence, Florence, Italy.

[2] High Risk Pregnancy Unit, Department for Women and Children Health, Careggi University Hospital, Florence, Italy.

DOI: 10.36129/jog.2024.S11

Objective. Hypertensive disorders of pregnancy (HDP) and prolonged second stage of labour are known risk factors for major post-partum haemorrhage (PPH). The study aim was to investigate the relationship between these three conditions.

Materials and Methods. Women who delivered vaginally at Careggi University Hospital between January and December 2023 were enrolled. Four groups were identified: women with HDP who pushed less than 2 hours (A), women with HDP who pushed more than 2 hours (B), women without HDP which pushed less than 2 hours (C) and women without HDP who pushed more than 2 hours (D). The rate of major PPH (blood loss > 1,000 ml) was compared among the groups. The other known risk factors for PPH such as BMI, induction of labour, augmentation, foetal macrosomia, fibroids and multiparity were included in the multivariate analysis.

Results. 1,047 women were included: 31/1,047 (3.9%) included in the group A, 3/1,047 (0.4%) in the group B, 709/1,047 (88.5%) in the group C, 58/1,047 (7.2%) in the group D. The rate of major PPH was higher in group B than in group D (3/58 5.17% *vs* 2/3 66%, p = 0.008) as when compared to group A (3/31 9.6%, p = 0.032). In the multivariate analysis prolonged second stage in HDP group resulted to be significantly associated with PPH ($p < 0.041$), as well as BMI ($p < 0.028$) and induction ($p < 0.049$).

Conclusions. Prolonged second stage of labour in women with HDP is associated with a higher risk of major PPH and this should be a warning for clinicians.

Predictive risk factors for hypertensive disorders in patients with gestational diabetes: a cohort study

Laura **La Fauci** [1,*], Rosario **D'Anna** [1], Cristina **Barracato** [1], Eliana **Zangla** [1], Chiara **Conti Nibali** [1], Antonino **Di Benedetto** [2], Francesco **Corrado** [1]

[1]Department of Human Pathology in Adulthood and Childhood "G. Barresi", Policlinico "G. Martino", University of Messina, Messina, Italy.
[2]Department of Clinical and Experimental Medicine, University of Messina, Messina, Italy.

DOI: 10.36129/jog.2024.S12

Objective. Hypertensive disorders in pregnancy (HDP) and gestational diabetes mellitus (GDM) represent two significant maternal cardiometabolic disorders closely related to each other. The study aim is to identify any gestational hypertension predictive risk factors in patients with GDM in our population.

Materials and Methods. This cohort study took place at the Department of Obstetrics and Gynecology, Policlinico "G. Martino" of Messina from January 2012 to December 2019; the study consisted of 684 pregnant women affected by GDM, diagnosed by Oral Glucose Tolerance Test (OGTT) according to Italian Guidelines. A medical history has been performed to identify any predictive risk factors for HDP. Patients with pre-gestational hypertension or diabetes were excluded.

Results. 684 pregnant women affected by GDM were enrolled: 478 (69.9%) had only one altered OGTT value, 137 (20.1%) two values and 69 (10%) all values. The mean age was 33 years; the mean pre-gestational BMI was 28; 3.1% had a GDM in the previous pregnancy; 340 (49%) had familiarity for GDM. 137 (20.1%) were treated with insulin. 70 of them had a diagnosis of HDP (10.2%).

Significant difference for pre-gestational BMI ($p < 0.01$) and percentage of obesity ($p < 0.003$) between groups is present. Moreover, there is an interesting difference between the mean of glycaemia after one hour of glucose uptake ($p < 0.001$), with a significant correlation between positive glycaemic value at 60' and hypertensive disorders ($p < 0.001$).

Conclusions. Obesity and glycaemia above the cut-off after 1 hour during OGTT are predictive risk factors of hypertensive disorders in patients affected by GDM.

Preliminary data on expression of ZSCAN4 and DUX4 in pregnancy complicated by preeclampsia

Antonio **Angelino** [1,*], Mariarita **Brancaccio** [2], Martina **Rispoli** [2], Silvia **Iannelli** [2], Geppino **Falco** [2,3], Tiziana **Angrisano** [2], Marika Ylenia **Rovetto** [1], Giulia **Gaudiello** [1], Maria **Terrone** [1], Marianna **De Falco** [1], Maurizio **Guida** [4], Giuseppe Maria **Maruotti** [1], Laura **Sarno** [4]

[1] Department of Public Health, University of Naples Federico II, Naples, Italy.
[2] Department of Biology, University of Naples Federico II, Naples, Italy.
[3] Biogem Scarl, Istituto di Ricerche Genetiche "Gaetano Salvatore", Ariano Irpino, Avellino, Italy.
[4] Department of Neurosciences and Reproductive and Odontostomatological Sciences, University of Naples Federico II, Naples, Italy.

DOI: 10.36129/jog.2024.S13

Objective. ZSCAN4 and DUX4 are involved in maintenance of stem cells and senescence and expressed at early stages in human embryos.
We aimed to evaluate their protein and gene levels in pregnancy complicated by preeclampsia (PE) compared to controls.
Materials and Methods. We collected a placental sample of 10 healthy controls, 10 women with early PE and 10 women with late PE. We analysed gene and protein levels of ZSCAN4 and DUX4 by quantitative RT-PCR and Western Blot.
Results. We reported an increase in ZCAN4 gene expression of 2.9 times compared to controls and 4.7 times compared to late PE by qRT-PCR. Western-blot analysis highlighted an increase in DUX4 in early PE equal to 0.8 compared to controls and 0.7 compared to late PE; the densitometric analysis of the protein levels of ZSCAN4 highlighted an increase in both the 57 (KDa, precursor) and 50 (KDa, active portion) bands of pregnant women with early PE of 2.2 and 0.7 respectively compared to controls and 2 and 0.7 compared to late PE.
Conclusions. With this preliminary study we paved the way for a panel of factors that might help to understand and monitor the syndrome; further studies on the expression of these two proteins in peripheral blood samples at the first stages of pregnancy could clarify a possible role of ZSCAN 4 and DUX4 in early prediction of PE.

Preliminary study on the role of human defensins and interleukins in early and late preeclampsia

Antonio **Angelino** [1,*], Paola **Borrelli** [2], Giuliana **Orlandi** [3], Alessandro **Gentile** [4], Cristina **Mennitti** [4], Mariella **Calvanese** [4], Raffaella **Pero** [4,5], Marika Ylenia **Rovetto** [1], Giuseppe Maria **Maruotti** [1], Laura **Sarno** [3], Olga **Scudiero** [4,5,6], Maurizio **Guida** [3]

[1] Department of Public Health, University of Naples Federico II, Naples, Italy.
[2] Department of Medical, Oral and Biotechnological Sciences, Biostatistics Laboratory, University of Chieti-Pescara "G. D'annunzio", Pescara, Italy.
[3] Department of Neurosciences and Reproductive and Odontostomatological Sciences, University of Naples Federico II, Naples, Italy.
[4] Department of Molecular Medicine and Medical Biotechnology, University of Naples Federico II, Naples, Italy.
[5] Task Force on Microbiome Studies, University of Naples Federico II, Naples, Italy.
[6] Ceinge-Biotecnologie Avanzate Franco Salvatore, Naples, Italy.

DOI: 10.36129/jog.2024.S14

Objective. Preeclampsia predisposes significantly to pregnancy-associated morbidity and mortality.
This study aims to evaluate levels of human defensins and interleukins compared to controls.
Materials and Methods. We recruited 30 pregnant women: 10 healthy pregnant women (CTR), 10 pregnant women with early preeclampsia (EP) and 10 pregnant women with late preeclampsia (LP). We evaluated biochemical and coagulation parameters. By gene expression, we assessed PCSK9, IL-2, IL-6, IL-8, IL-10, TNF-α and TGF-β. Moreover, we evaluated both the serum and gene levels of the defensins HBD-1, HBD-2, HBD-4 and HNP-1.
Results. Our results showed a difference between groups in gene expression levels of IL-6, $p < 0.001$ (EP *vs* CTR: median 11.7 *vs* 0.5, $p < 0.001$; LP *vs* CTR: median 3.3 *vs* 0.5, $p = 0.001$; EP *vs* LP: median 11.7 *vs* 3.3, $p = 0.005$) and IL-8, $p = 0.014$ (EP *vs* CTR: median 634.1 *vs* 225.6, $p = 0.012$ and EP *vs* LP: median 634.1 *vs* 214.5, $p = 0.013$) highlighting an activation of immune system during preeclampsia; on the other hand, higher serum levels of HBD1 in LP compared to CTR (median 278.8 *vs* 67.8, $p = 0.005$) and to EP (median 278.8 *vs* 68.6, $p = 0.001$) could play protective actions to prevent the loss of the foetus.
Conclusions. Our results showed an increase in gene expression levels of IL-6 and IL-8 in EP compared to LP and CTR, highlighting a massive activation of immune system especially in case of severe preeclampsia; however, higher levels of HBD1 in LP might indicate that the same immune system develops protective actions to prevent adverse outcome in these cases.

Haemodynamic evaluation at term: is it predictive of adverse perinatal outcomes? A monocentric retrospective study

Gloria **Guariglia** [1,*], Serena **Lecis** [1], Jessica **Bugiolacchi** [1], Valeria **Pedrini** [1], Beatrice **Melis** [1], Anna Luna **Tramontano** [2], Fabio **Facchinetti** [1], Antonio **La Marca** [1], Francesca **Monari** [1]

[1] UO Obstetrics and Gynecology, AOU Policlinico of Modena, Modena, Italy.
[2] Ospedale Evangelico Villa Betania, Naples, Italy.

DOI: 10.36129/jog.2024.S15

Objective. Aim of this study is to describe the correlation between maternal haemodynamic parameters obtained through USCOM performed beyond term and adverse perinatal outcomes (APO).

Materials and Methods. This is a retrospective monocentric descriptive study promoted by AOU Policlinico di Modena. The study period is January to December 2023. 157 patients have been enrolled: 124 of them were low risk pregnancies while 33 were affected by hypertensive disorder of pregnancy (HPD) and/or foetal growth restriction (FGR), in charge at our high risk pregnancy clinic. All of them received USCOM evaluation beyond term. APO at birth were defined as the presence of one of those complications: emergency caesarean section (eCS)/operative delivery (OD), postpartum haemorrhage (PPH), NICU admission, 5-minute APGAR < 7. Data have been collected from medical records and elaborated thanks to the software SPSS (version 29).

Results. At univariate analysis, pregnancies complicated by HDP and/or FGR presented higher values of PAS, PAD, PAM and CI (P-values of 0.002, 0.005, 0.006, 0.003, respectively). Moreover, at logistic multivariate regression we found that higher values of RVS (P-value = 0.041) and reduction of CO (P-value = 0.004) are statistically related to higher risk of APO independently by the presence of Hypertension and/or FGR.

Conclusions. Although a bigger sample is mandatory, our analysis shows the possibility to predict undesirable obstetrical outcomes performing USCOM evaluation at term, especially in high-risk pregnancies.

The ability of sFlt-1/PlGF ratio for preeclampsia characterization

Francesca **Stollagli** [1,*], Silvia **Buongiorno** [1], Stefano **Fruci** [1], Sascia **Moresi** [1], Roberta **Rullo** [1], Federica **Totaro Aprile** [1], Mariateresa **Rega** [2], Silvia **Salvi** [1,2], Sergio **Ferrazzani** [1,2], Antonio **Lanzone** [1,2]

[1] Department of Women's and Child Health and Public Health Sciences, Fondazione Policlinico Agostino Gemelli, IRCSS, Rome, Italy.
[2] Department of Life Sciences and Public Health, Università Cattolica del Sacro Cuore, Rome, Italy.

DOI: 10.36129/jog.2024.S16

Objective. Aim of our study is to confirm the role of sFlt-1/PlGF ratio in diagnosis and monitoring of preeclampsia (PE) and foetal growth restriction (FGR), to better manage and predict maternal and foeto-neonatal adverse outcomes.
Materials and Methods. This is an observational study on 75 singleton pregnancies admitted in our Division for High-Risk Pregnancies between September 2021 and April 2023 with a diagnosis of Preeclampsia and/or FGR.
Results. Three groups were identified: early-onset PE (Group A n = 24), late-onset PE (Group B n = 7), FGR (Group C n = 44). Different statistically significant differences were observed among groups with lower pre-pregnancy BMI in group C and higher gestational weight gain in group B. The lowest gestational age at diagnosis was in Group A but the lowest foetal weight centile was of Group C. Regarding neonatal outcome, the worst outcome in terms of gestational age at delivery, neonatal weight and APGAR 5th was found in Group A that at admission presents the higher sFlt-1/PlGF ratio; this difference was statistically significant in comparison to Group C (246.8 ± 225 *vs* 89.7 ± 128, P-value = 0.0001) but not *versus* Group B (p = 0.472); however, the sFlt-1/PlGF ratio was significant higher in Group B than in Group C (181.8 ± 116 *vs* 89.7 ± 128, P-value = 0.008).
Conclusions. Our data confirm the potential use of this biomarkers in clinical practice to identify preeclampsia in women suspected clinically to have and guide clinicians in the surveillance and management of these clinical conditions.

Successful induction of labour in a patient with antepartum eclampsia: a case report and literature review

Annalisa **Graziano** *, Valentina **Zanin**, Ginevra **Battello**, Marta **Angelini**, Lorenza **Driul**

Obstetrics and Gynecology Clinic, Ospedale Santa Maria Della Misericordia, Udine, Italy.

DOI: 10.36129/jog.2024.S17

Background. Eclampsia leads to significant risks during pregnancy, necessitating prompt management. Conventionally, caesarean delivery is often considered the preferred option. However, this case report presents an alternative approach by successfully inducing labour in a 22-year-old nulliparous woman with antepartum eclampsia.

Case presentation. Admitted at 37 weeks with seizures and elevated blood pressure, the patient stabilized with magnesium sulphate and antihypertensive therapy. Despite unfavourable Bishop scores, labour was induced using prostaglandins, culminating in a vaginal delivery after 26 hours. Both maternal and neonatal outcomes were favourable.

Results. The case challenges the routine reliance on caesarean delivery for eclampsia, emphasizing the importance of individualized care. It reviews conflicting recommendations on delivery modes, underlining factors such as gestational age and maternal stability as crucial in decision-making.

Conclusions. This case suggests that, under careful monitoring and maternal stabilization, induction of labour can be a viable option for achieving vaginal delivery in eclamptic patients with unfavourable Bishop scores. The study underscores the necessity of personalized approaches and further research to delineate the optimal mode of delivery in eclampsia cases. The use of magnesium sulphate, antihypertensive medications, and vigilant obstetric interventions remain essential for ensuring optimal maternal and foetal outcomes.

Haemodynamic evaluation in pregestational hypertensive disorders: does the introduction of USCOM in clinical practice change outcomes? A monocentric retrospective study

Serena **Lecis** [1,*], Gloria **Guariglia** [1], Valeria **Pedrini** [1], Jessica **Bugiolacchi** [1], Beatrice **Melis** [1], Anna Luna **Tramontano** [2], Fabio **Facchinetti** [1], Antonio **La Marca** [1], Francesca **Monari** [1]

[1] Obstetrics and Gynecology Unit, Department of Mother-Infant and Adult of Medical and Surgical Sciences, University of Modena and Reggio Emilia, Modena, Italy.
[2] Department of Neurosciences and Reproductive and Odontostomatological Sciences, University of Naples Federico II, Naples, Italy.

DOI: 10.36129/jog.2024.S18

Objective. The objective of this study is to investigate maternal and perinatal outcomes in pregnant women with chronic hypertensive disorder (HD), before and after the introduction of USCOM in clinical practice.

Materials and Methods. This is a retrospective monocentric descriptive study promoted by AOU Policlinico di Modena. USCOM was introduced into our third level clinic in March 2022. Pregnant women with HD assisted in 2021 were twenty-two (control group) and in 2023 were forty-six (USCOM group). In the latter group, USCOM monitoring was performed during the pregnancy for modulating and customized the hypertensive therapy. Patients with missing delivery data and gestational hypertension were excluded. Maternal and neonatal outcomes were retrospectively collected from the electronic record. Statistical analyses were conducted using IBM SPSS software version 29.0. Continuous variables were expressed as mean and standard deviation, categorical variables were expressed as total count and percentage.

Results. No differences in maternal characteristics were found between the two groups.

At univariate analysis, USCOM group had a statistically significant lower rate of newborn with birth weight less than 2,500 g (36.4% *vs* 6.5%; p = 0.002). Moreover, USCOM group had a tendency to have fewer extremely preterm births (< 34 weeks, p = 0.06) and fewer infants admitted to the NICU (p = 0.06), although did not reach the statistically significance. At logistic regression we confirmed that USCOM group had statistically significance fewer infants with birth weights less than 2,500 g (p = 0.005).

Conclusions. Although a bigger sample is mandatory, our analysis shows that the introduction of USCOM in clinical practice improves neonatal outcomes.

Hypertensive disorders and pregnancy outcomes in oocyte donation pregnancy in comparison with *in vitro* fertilization group

Maria **Volotovskaya** *, Francesca **Piazzini**, Paolo **Evangelisti**, Anna **Morucchio**, Maria Costanza **Zanon**, Patrizia **Falcone**, Rossella **Fucci**, Laura **Badolato**, Denise **De Angelis**, Sara **Rubini**, Rita **Picone**, Francesca **Rizzello**, Maria Elisabetta **Coccia**

Careggi University Hospital, Florence, Italy.

DOI: 10.36129/jog.2024.S19

Objective. The use of oocyte donation (OD) is in important growth in last decades, became an inseparable part of assisted reproductive technology (ART) for infertile women wishing pregnancy.

The objective was to evaluate the impact of OD on hypertensive disorders and maternal-foetal outcomes compared with IVF (FIVET-ICSI) group.

Materials and Methods. Retrospective analysis of OD pregnancy follow-up from 2016-2023, obtained in Center of ART of Careggi University Hospital, Florence. The study population included 512 (35%) OD pregnancies, 925 (65%) FIVET-ICSI pregnancies.

Results. Overall of preeclampsia diagnosis was in 54 (10.5%) OD and 68 (7.4%) FIVET-ICSI pregnancies (confidence value = 95%, p = 0.037). For OD, vaginal delivery (VD) was observed in 10 (18%); the caesarean section (CS) was found in 44 (82%) of preeclampsia cases. VD in FIVET-ICSI group was 17 (26%), CS was in 51 (75%) preeclampsia cases (no statistical significance).

OD complicated with preeclampsia, 25 (38%) newborns were delivered before 36 weeks, and it was found low birth weight in 49 (75%) newborns. 19 (29%) newborns were hospitalized in neonatology department; 1 (2%) case of intrauterine foetal death and 2 (3%) cases of peripartum neonatal death were observed.

Conclusions. OD has major risk of hypertensive disorders and maternal- perinatal complications compared with FIVET-ICSI; otherwise, no statistic significancy was observed for delivery type, which might be explained by general higher risk of caesarean section in preeclampsia.

Perinatal findings of women with pregnancy related haemolytic uremic syndrome: a case series from a single Italian tertiary perinatal care centre

Sascia **Moresi** [1,*], Elisabetta **Metafuni** [2], Rachele Maria **Magnaterra** [3], Francesca **Stollagli** [1], Stefano **Fruci** [1], Roberta **Rullo** [1], Silvia **Salvi** [1,3], Simona **Sica** [2,4], Antonio **Lanzone** [1,3]

[1] Department of Women's and Child Health and Public Health Sciences, Fondazione Policlinico Agostino Gemelli, IRCSS, Rome, Italy.
[2] Department of Diagnostic Imaging, Radiation Oncology and Hematology, Fondazione Policlinico Agostino Gemelli, IRCSS, Rome, Italy.
[3] Department of Life Sciences and Public Health, Università Cattolica del Sacro Cuore, Rome, Italy.
[4] Section of Hematology, Department of Radiological and Hematological Sciences, Università Cattolica del Sacro Cuore, Rome, Italy.

DOI: 10.36129/jog.2024.S20

Objective. Pregnancy-associated atypical haemolytic uraemic syndrome (aHUS) is a rare and potentially lethal complement-mediated disorder. It can mimic preeclampsia, thrombotic thrombocytopenic purpura and HELLP syndrome. Thus, it can be hard to distinguish pregnancy-associated aHUS from other causes in peri/post-partum women presenting with features of microangiopathic haemolytic anaemia, thrombocytopenia and acute kidney injury.

Materials and Methods. We retrospectively search our electronic medical records for pregnant women who delivered at the perinatal centre of our hospital and developed perinatal thrombotic microangiopathy for evaluating their characteristics at the time of disease onset, final diagnosis, and maternal and foetal outcomes.

Results. Five women who developed aHUS were found. All pregnancies were singleton with the exception with one spontaneous twin pregnancy. Mean maternal age was 33.6; the mean maternal pre-conceptional BMI was of 24.3 kg/m^2. The twin pregnancy ended with a term vaginal delivery induced for preeclampsia. All the other four pregnancies were complicated by placental abruption with two stillbirths and two urgent preterm CS. Of six foetuses, four neonates were alive with a mean birthweight of 1,722.5 g. All women developed severe renal impairment (maximum creatinine level of 4.8 mg/dl) and thrombocytopenia (minimum level of 35.8 × 109/L) within 24 hours after delivery. A diagnosis of aHUS was performed, and treatment with eculizumab was initiated with rapid improvement of both clinical and laboratory parameters.

Conclusions. Our case series confirm the high frequency of overlapping conditions with placental abruption and preeclampsia preceding the post-partum aHUS diagnosis. High risk of foetal loss is also demonstrated.

Maternal haemodynamic function and angiogenic markers in COVID-19 pregnant patients with and without hypertensive disorders of pregnancy

Elisa **Sabattini** [1,*], Elena **Zaccone** [1], Lucrezia **Viscioni** [1], Marco **Parasiliti** [1], Camilla **Garbin** [1], Vittoria **Sterpi** [1], Letizia **Li Piani** [1], Tamara **Stampalija** [2], Enrico **Ferrazzi** [3]

[1] Department of Obstetrics and Gynecology, Fondazione IRCCS Ca' Granda, Ospedale Maggiore Policlinico, Milan, Italy.
[2] Unit of Fetal Medicine and Prenatal Diagnosis, Institute for Maternal and Child Health IRCCS Burlo Garofolo, Trieste, Italy.
[3]Department of Clinical Sciences and Community Health, University of Milan, Milan, Italy.

DOI: 10.36129/jog.2024.S21

Objective. To analyse maternal haemodynamic function and endothelial inflammation in pregnant patients affected by COVID-19 with and without HDP compared to healthy pregnant women.

Materials and Methods. Singleton pregnancies with COVID-19, matched 1:4 with healthy controls of similar gestational age and subsequent sub-analysis to compare HDP in COVID-19 and non-COVID-19 patients. All study participants were sampled for measurement sFlt-1/PlGF ratio, and of maternal cardiovascular haemodynamic using the USCOM.

Results. 52 SARS-CoV-2 positive and 311 SARS-CoV-2 negative pregnant women were recruited at our in-patient high-risk Obstetric Unit. Respectively, 19 and 92 pregnant patients admitted were complicated by HDP.

Median sFlt-1/PlGF ratio was the normal range in COVID-19 patients (9; IQR 3.3-27) and non-COVID-19 (5.4; IQR 2.9-13.9). Median sFlt-1/PlGF ratio proved to be non-significantly different, even when the sub analysis for HDP was performed: HDP-COVID-19 (28.7; IQR 9.9-69.7) *versus* HDP-non-COVID-19 (10.7; IQR 4.5-77.8).

Median maternal cardiac output in COVID-19 (6.2 L/min; IQR 5.4-7.1), and non-COVID-19 (5.8 lit/min; IQR 5.1-6.6) and total vascular resistance in COVID-19 (1,080 dynes*; IQR 915-1,370), and non-COVID-19 (1,249 dynes*; IQR 1,061-1,398) were not significantly different between the two cohorts.

When the sub analysis for HDP was performed, we observed significantly higher systemic vascular resistance both in non-COVID-19-HDP, and COVID-19 HDP *versus* non HDP cases, but there were no significantly differences between non COVID-19-HDP and COVID-HDP groups ($p = 0.136$).

Conclusions. COVID-19 infection did not influence cardiac output and vascular resistances nor increased sFlt-1/PlGF ratio. Even when HDP occurred cardiovascular function was worse in both groups, independently from COVID-19.

Maternal haemodynamic changes in gestational diabetes mellitus (GDM) with or without hypertensive disorders of pregnancy (HDP)

Chiara **Biagiotti** [1,*], Eleonora **Romani** [1], Serena **Ottanelli** [2], Laura **Angeli** [2], Sara **Zullino** [2], Marianna Pina **Rambaldi** [2], Caterina **Serena** [2], Serena **Simeone** [2], Silvia **Vannuccini** [2], Giacomo **Bruscoli** [2], Felice **Petraglia** [1], Federico **Mecacci** [1,2]

[1] Obstetrics and Gynaecology Unit, Department of Experimental and Clinical Biomedical Sciences, University of Florence, Florence, Italy.

[2] High Risk Pregnancy Unit, Department for Women and Children Health, Careggi University Hospital, Florence, Italy.

DOI: 10.36129/jog.2024.S22

Objective. Maternal haemodynamic maladaptation has been described in pregnancies complicated by GDM or HDP. The aim of our study was to compare haemodynamic features in GDM pregnancies with or without HDP (GDM-HDP *versus* isolated GDM).

Materials and Methods. A prospective study including 121 GDM patients referred to our unit from 2022 to 2023 was conducted. Haemodynamic assessment was performed by Ultra-Sonic Cardiac Output Monitor (USCOM) at three gestational age intervals: 26-30, 32-35, 36-38 weeks.

Results. 11 GDM women developed HDP (9%). There were no differences in anthropometric maternal parameters between the two groups, except for higher maternal age in GDM-HDP group (40.82 ± 7.8 *versus* 36.73 ± 5.3). No differences were found in OGTT values, glycaemic control, and perinatal outcomes (urgent caesarean section, birth weight, pH < 7, five-minute APGAR < 7, bases excess > 12, neonatal intensive care unit admission). Gestational age at delivery was lower in GDM-HDP group (38.2 ± 0.9 *versus* 39.1 ± 1.2 weeks). Total vascular resistance (TVR) at third USCOM assessment was higher in GDM-HDP group compared to isolated GDM (1,061.60 *vs* 1,315.09, p = 0.001). At logistic regression, neither maternal age or TVR were independently associated with HDP development in GDM patients.

Conclusions. A worse haemodynamic adaptation to pregnancy, expressed by higher TVR, can be detected in GDM-HDP population, probably for combined effects of advanced maternal age, high blood pressure and hyperglycaemia on vascular system. This could be helpful in detecting a subgroup of GDM patients with a predisposition to cardiovascular disease in later life.

Low nephron endowment and renal maladaptation to pregnancy as possible pathogenetic mechanism of preeclampsia

Silvia **Visentin** [1,*], Erich **Cosmi** [1], Pierpaolo **Zorzato** [1], Camilla Velasco **Carandente** [1], Maria Cristina **Mancuso** [2], Dario **Consonni** [3], Gianluigi **Ardissino** [2]

[1] Department of Woman's and Child's Health, Obstetrical and Gynecological Clinic, University of Padova, Padua, Italy.
[2] Center for HUS Prevention, Control and Management, Fondazione IRCCS Ca' Granda, Ospedale Maggiore Policlinico, Milan, Italy.
[3] Epidemiology Unit, Fondazione IRCCS Ca' Granda, Ospedale Maggiore Policlinico, Milan, Italy.

DOI: 10.36129/jog.2024.S23

Objective. We evaluated the association of serum creatinine (sCr) during the I trimester of pregnancy and preeclampsia (PE) based on the theoretical hypothesis that PE is a clinical expression of poor nephron endowment with the inability of kidneys to meet the increased functional demands of pregnancy, for the followings reasons: 1) renal patients (including solitary kidney) are at increased risk of PE; 2) most patients with PE are healthy before and after pregnancy; 3) the recurrence of PE in families and subsequent pregnancies; 4) the increased risk of hypertension and renal insufficiency later in the life of PE patients.

Materials and Methods. Fifty-two women with PE and 49 normal pregnancies with normal renal function, were studied. We calculated (univariate logistic regression) the PE odds ratio (OR) according to sCr during pregnancy.

Results. We found a strong positive association between sCr at I trimester and PE (OR 1.2 per mmol/L of sCr, 95%CI 1.1-1.3, $p < 0.0001$). The corresponding AUC of the ROC curve was 0.85 (95%CI 0.77-0.94). Using 50 mmol/L as the cut-off, sensitivity was 0.79 (95%CI 0.66-0.88) and specificity 0.94 (95%CI 0.83-0.99).

Conclusions. SCr in the I trimester, although in the normal range, was strongly associated with PE. The higher risk of PE for sCr > 50 mmol/L (0.57 mg/dL) may be due to the reduced renal functional reserve related to low nephron endowment with a consequent maladaptation to the increased pregnancy-related functional demand. The increase in blood pressure and proteinuria might be due to sub-optimal renal clearance of placental-derived metabolites toxic to the endothelium. SCr measured early in pregnancy may be a promising predictive marker of PE.

Insights into adverse pregnancy outcomes prevention in chronic hypertension

Rossella **Monaci** *, Sara **Branca**, Chiara **Tomasoni**, Silvia **Sartorello**, Adriana **Valcamonico**, Francesca **Ramazzotto**, Sonia **Zatti**, Rossana **Orabona**, Franco Edoardo **Odicino**

Department of Obstetrics and Gynaecology, ASST Spedali Civili, University of Brescia, Brescia, Italy.

DOI: 10.36129/jog.2024.S24

Objective. To determine optimal strategies to reduce the incidence of adverse pregnancy outcomes in women with chronic hypertension.

Materials and Methods. Women diagnosed with chronic hypertension were retrospectively selected from our electronic database from January 2019 to January 2024. The primary endpoint was the occurrence of adverse pregnancy outcome described as the onset of preeclampsia (PE) or foetal growth restriction (FGR).

Results. 219 women were diagnosed with chronic hypertension, of which 158 delivered in our hospital and were included in the final cohort. Mean body mass index at delivery was 30.8 kg/m^2 and mean age 36 years. PE and FGR occurred in 23% and 8% of patients, respectively. Blood pressure was managed by nifedipine (61%), labetalol (10%) or methyldopa (5%). As concerns prophylaxis, 79% of patients were administered acetylsalicylic acid (ASA) while 16% low molecular weight heparin (LMWH) as thromboprophylaxis, of which 86% ASA + LMWH. The rate of PE was similar in patients tacking ASA or not (21% *vs* 25%), while it significantly differed in those administered with LMWH (9% *vs* 25%, $p = 0.041$). FGR occurrence did not differ according to the use of prophylaxis. High resistance at uterine artery Doppler velocimetry at 24/25 weeks of gestation was associated with PE (51% *vs* 12%; $p < 0.001$) and FGR (18% *vs* 7%; $p = 0.040$).

Conclusions. Increasing numbers of pregnancies are complicated by chronic hypertension because of age at conception together with the global epidemic of obesity. Thromboprophylaxis with LMWH reduces the onset of superimposed PE, independently from ASA intake.

Anti-C1q autoantibodies in pregnancy: a potential biomarker for preeclampsia onset in ART gestation?

Miriam **Toffoli** [1,*], Gabriella **Zito** [2], Andrea **Balduit** [2], Riccardo **Lauria** [5], Alessandro **Mangogna** [2], Silvia **Pegoraro** [2], Nicoletta **Di Simone** [3], Uday **Kishore** [4], Chiara **Agostinis** [2], Tamara **Stampalija** [2], Roberta **Bulla** [5], Giuseppe **Ricci** [2]

[1] Department of Medical, Surgical and Health Science, University of Trieste, Trieste, Italy.
[2] Institute for Maternal and Child Health IRCCS Burlo Garofolo, Trieste, Italy.
[3] IRCCS Humanitas Research Hospital, Trieste, Italy.
[4] Department of Veterinary Medicine, U.A.E. University, Al Ain, United Arab Emirates.
[5] Department of Life Sciences, University of Trieste, Trieste, Italy.

DOI: 10.36129/jog.2024.S25

Objective. C1q protein, the classical complement pathway activator, is a crucial player in early placentation, promoting trophoblast invasion and spiral artery remodelling. C1q-deficient mice display preeclamptic symptoms. Despite being prevalent in autoimmune diseases (AIDs), anti-C1q autoantibodies (anti-C1q) are present in 2-8% of the healthy population. In our previous study, elevated anti-C1q levels were observed in the first trimester of healthy pregnancies, contrasting with lower levels in women developing preeclampsia (PE) and in oocyte donation pregnancies (OD), which have a high risk of PE. This study aims to characterize the specificity of anti-C1q in physiological pregnancy compared to those found in pathological conditions.

Materials and Methods. Sera from healthy spontaneous, PE, and OD pregnancies, followed at the IRCCS Burlo Garofolo (Trieste, Italy), were collected at each trimester. Pregnant women affected by autoimmune diseases were also included.

Results. In healthy pregnancies anti-C1q targets primarily the globular domain (g) of C1q, in contrast to AID-associated anti-C1q that recognize its collagen-like region (CLR) (P-value = 0.0291). Immunoglobulin subclass analysis revealed IgG2 prevalence in both healthy and AID pregnancies, suggesting a shared immunological response. Functional assays demonstrated that healthy pregnancy-associated anti-C1q modulated the classical complement pathway activation, potentially in a protective manner (% functionality with gh = 87.5 ± 6.1, with CLR = 101.7 ± 5.5, with no anti-C1q = 100.0 ± 6.2).

Conclusions. This research highlights anti-C1q functional specificity in healthy pregnancies, emphasizing a unique targeting of C1q globular domain. Observed pathogenic roles of anti-CLR autoantibodies underscore potential immunological role to pregnancy complications. Further investigations are needed to unveil mechanisms and assess their possible use as early predictive biomarkers of PE.

Effect of pravastatin on placental expression of EGFL7 in preeclampsia: a new potential therapeutic approach

Silvia **Salvi** [1,2,*], Micol **Massimiani** [3], Stefano **Fruci** [1], Valentina **Lacconi** [3], Federica **Totaro Aprile** [2], Heidi **Stuhlmann** [5], Sergio **Ferrazzani** [1,2], Luisa **Campagnolo** [4]

[1] Obstetric Pathology Unit, Department of Women's and Child Health and Public Health Sciences, Fondazione Policlinico Agostino Gemelli, IRCSS, Rome, Italy.
[2] Department of Life Sciences and Public Health, Università Cattolica del Sacro Cuore, Rome, Italy.
[3] Saint Camillus International, University of Health Sciences, Rome, Italy.
[4] Department of Biomedicine and Prevention, University of Rome Tor Vergata, Rome, Italy.
[5] Department of Cell and Developmental Biology, Weill Cornell Medical College, New York (NY), U.S.A.

DOI: 10.36129/jog.2024.S26

Objective. Epidermal Growth Factor Like Domain 7 (EGFL7) is an angiogenic factor, highly expressed in physiologic and pathologic angiogenesis. In pregnancies complicated by preeclampsia (PE), a significant EGFL7 downregulation in placental tissues has been already demonstrated.

Pravastatin (PRA) is a lipid-lowering drug recently evaluated for treatment and/or prophylaxis of PE, whereas low dose aspirin (LDA) is the drug of choice. Aim of our pilot case-control study is to evaluate the ability of PRA to modulate EGFL7 expression.

Materials and Methods. 18 women were enrolled: 10 controls, 4 pure and 4 treated early-onset PE (e-PE). In all groups, chorionic villous explants were cultured for 24 hours with or without 10 μM PRA. Gene and protein expression of EGFL7 was quantified by qRT-PCR and Western Blot analysis on RNA and protein extracts, respectively.

Results. PRA significantly increased EGFL7 gene expression in villous explant cultures from healthy and even more in those from pure e-PE pregnancies ($p < 0.001$), while its levels decreased in treated e-PE villi ($p = 0.001$). NOTCH and its target genes were significantly upregulated by PRA in healthy and pure e-PE, while PRA gave an opposite effect in treated e-PE.

Conclusions. PRA can modulate the expression of EGFL7 in human placenta; from a clinical point of view, the effect of PRA encourages the use of this molecule for prevention rather than treatment of PE, when placental damage is established; moreover, the response of EGFL7 to the treatment with PRA seems to be less efficacious when other treatment for PE has been performed.

Correlations between foeto-maternal haemodynamic parameters and foetal growth velocity in a cohort of physiological singleton pregnancies

Roberto **Nuredini** [1,*], Giulia **Zamagni** [2], Camilla **Fregona** [1], Moira **Barbieri** [3], Stefania **Zanini** [1], Carmelina **Foti** [1], Bruno **Fabris** [4,5], Federica **Tonon** [5], Giuseppe **Ricci** [1,5], Stella **Bernardi** [4,5], Tamara **Stampalija** [5,6]

[1] Department of Obstetrics and Gynaecology, Institute for Maternal and Child Health IRCCS Burlo Garofolo, Trieste, Italy.
[2] Clinical Epidemiology and Public Health Research Unit, Institute for Maternal and Child Health IRCCS Burlo Garofolo, Trieste, Italy.
[3] Department of Mother, Child and Neonate, Fondazione IRCCS Ca' Granda, Ospedale Maggiore Policlinico, Milan, Italy.
[4] Unit of Endocrinology, Azienda sanitaria universitaria Giuliano Isontina (ASU GI), Cattinara Teaching Hospital, Trieste, Italy.
[5] Department of Medical Surgical and Health Sciences, University of Trieste, Trieste, Italy.
[6] Unit of Fetal Medicine and Prenatal Diagnosis, Institute for Maternal and Child Health IRCCS Burlo Garofolo, Trieste, Italy.

DOI: 10.36129/jog.2024.S27

Objective. Foetal growth is determined by the individual genetic growth potential and the function of foeto-maternal haemodynamic unit. The aim of this study was to determine the correlations between utero-placental and foeto-placental blood flow volume and maternal haemodynamics.
Materials and Methods. This was a prospective observational study which included 58 physiological singleton pregnancies. Patients were enrolled in the first trimester and underwent haemodynamic assessment with Ultrasonic Cardiac Output Monitor (USCOM) at 12, 20, 30 and 35 gestational weeks. Ultrasound assessment of foetal biometry and Doppler velocimetry was performed at 20, 30 and 35 weeks, including umbilical and uterine blood flow volume (UV-Q, UtA-Q). The Spearman rank coefficient was used to assess the correlations.
Results. The analysis showed that increase of Potential to Kinetic Ratio is directly proportional to UtA-Q (Rho = 0.52, $p < 0.001$). Furthermore, UV-Q was positively correlated with maternal cardiac output (Rho = 0.54, $p < 0.001$), and to lesser extent with stroke volume (Rho = 0.44, $p = 0.006$), heart rate (Rho = 0.33; $p = 0.04$) and inotropy (Rho = 0.36, $p = 0.03$).
Conclusions. Maternal haemodynamic parameters are correlated with uterine and foetal blood flow perfusion and supply. Understanding these correlations could improve clinical strategies to optimize maternal and neonatal outcomes.

Adverse foetal outcomes in patients with increased risk of preterm preeclampsia in the first trimester of pregnancy: a prospective study

Giorgia **Polizzi** [1,2,*], Silvia **Andrietti** [3,4], Diliana **Beleva** [3,4], Chiara **Gaggero** [3,4], Chiara **Calcagno** [3,4], Valentina **Musante** [1,2], Mariangela **Cirino** [1,2], Pierangela **De Biasio** [3,4]

[1] Academic Unit of Obstetrics and Gynecology, IRCCS Ospadale Policlinico San Martino, Genoa, Italy.
[2] Department of Neurology, Rehabilitation, Ophtalmology, Genetics, Maternal and Infant Health (DiNOGMI), University of Genoa, Genoa, Italy.
[3] Prenatal Diagnosis and Perinatal Medicine Unit, IRCCS Ospadale Policlinico San Martino, Genoa, Italy.
[4] Department of Maternal and Child Health, IRCCS Ospadale Policlinico San Martino, Genoa, Italy.

DOI: 10.36129/jog.2024.S28

Objective. To assess the rate for placenta-mediated adverse pregnancy outcomes (preeclampsia, preterm birth PTB, small for gestational age SGA) in women at high risk of preterm preeclampsia in the first trimester and to evaluate a possible association between placental dysfunction and foetal abnormalities.

Materials and Methods. Pregnant patients were offered first trimester screening for preterm preeclampsia based on the Fetal Medicine Foundation algorithm; with a risk score ≥ 1:150 were recommended to use aspirin (150 mg/day) from screening until 36 weeks.

Between November 2022-October 2023, 975 patients were enrolled. 162 patients (16%) screened positive for preeclampsia. From this cohort, we analysed 400 pregnancy outcome records: 76 at high risk (HR) for preeclampsia, 324 at low risk (LR).

Results. HR women showed higher rate of preterm preeclampsia (2.63%) compared to LR women (0.3%). The rates of gestational hypertension (11%) and SGA (14.5%) were also higher in the HR group (respectively 2.5% and 9.2% in the LR group). The HR group showed a higher rate of early and late PTB (1.3% and 11% *vs* 0.9% and 3.1% in LR group). Congenital anomalies in euploid foetuses were more frequent in HR patients (7.9%) compared to LR ones (4.6%).

Women identified at HR of preterm preeclampsia are also at increased risk of other placenta-mediated adverse pregnancy outcomes (PTB, SGA); they may benefit from a higher surveillance care pathway.

Conclusions. The risk of foetal structural anomalies is greater in HR women: we recommend a careful foetal anatomical ultrasound evaluation in the first and second trimester to early identify foetal structural anomalies.

Foetal growth restriction and maternal hypertensive disorders: a case series from Udine

Ginevra **Battello** [1,*], Serena **Xodo** [2], Marta **Angelini** [2], Valentina **Zanin** [1], Annalisa **Graziano** [1], Lorenza **Driul** [1]

[1] Università degli Studi di Udine, Udine, Italy.
[2] Azienda sanitaria universitaria Friuli Centrale (ASU FC), Udine, Italy.

DOI: 10.36129/jog.2024.S29

Objective. This study aimed at investigating the outcomes of foetal growth restriction (FGR) and its association with maternal hypertensive disorders.

Materials and Methods. We included in our analysis women with a FGR diagnosis who delivered from 2020 to 2023 at the University Hospital of Udine. Our cases were divided into early-FGR and late-FGR, according to the ISUOG guidelines published in 2020.

Results. Out of 139 women with FGR, 51 had an early FGR, whereas 88 had a late FGR.

Patients with early FGR received the diagnosis at 27 weeks and delivered at 35+4 weeks on average. The mean birthweight was 1,906.6 grams, 62.7% required NICU admission, and 1 newborn died. Almost half women had a caesarean delivery, mostly due to antepartum non-reassuring foetal heart rate status and Doppler umbilical artery abnormalities (80% of cases).

A total of 88 patients received a late FGR diagnosis. The mean gestational age at diagnosis was 35+1 gestational weeks, while the mean gestational age at delivery was 38 weeks. The mean birthweight was 2,470.5 grams, 19.3% required NICU admission. Most women delivered vaginally (68.1%). Almost one in three women had a caesarean delivery. Interestingly, most caesarean deliveries occurred intrapartum (31.8%).

Hypertensive disorders were retrieved in 31.4% cases with early FGR and in 15.9% cases with late FGR. This difference was not statistically significant.

Conclusions. This cases series analysis confirms that early-FGR is associated with worse perinatal outcomes than late-FGR. The impact of maternal hypertensive disorders on perinatal outcome is similar among the 2 groups.

Longitudinal changes oxidative stress markers and uterine arteries impedance in pregnancies complicated by hypertensive disorder of pregnancy and foetal growth restriction

Lucrezia **Viscioni** [1,*], Andrea **Caricati** [1], Elisa **Sabattini** [1], Serena **Cerri** [1], Moira **Barbieri** [1], Tatjana **Radaelli** [1], Giulia **Zamagni** [2], Gabriele **Tinè** [3], Tamara **Stampalija** [4], Enrico **Ferrazzi** [1], Daniela **Di Martino** [1]

[1] Clinica Mangiagalli, Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico, University of Milan, Milan, Italy.
[2] Clinical Epidemiology and Public Health Research Unit, Institute for Maternal and Child Health IRCCS Burlo Garofolo, Trieste, Italy.
[3] Department of Economics and Quantitative Methods, University of Milano Bicocca, Milan, Italy.
[4] Department of Maternal and Neonatal, IRCCS Burlo Garofolo, University of Trieste, Trieste, Italy.

DOI: 10.36129/jog.2024.S30

Objective. To study across pregnancies complicated by hypertensive disorders of pregnancy (HDP) and fetal growth restriction (FGR) biochemical and biophysical changes.

Materials and Methods. Singleton pregnancies underwent uterine artery Doppler and a blood sFlt-1/PlGF ratio determination during each trimester of pregnancy. Women were grouped according to the pregnancy outcome: HDP, FGR, uneventful pregnancies. A longitudinal Bayesian multivariate mixed-effects model, corrected both for pre-gestational BMI and gestational age at diagnosis, was performed.

Results. 519 patients were enrolled. Preliminary data from 24 chronic hypertension (CH), 19 HDP with appropriate-for-gestational-age foetus (AGA), 3 HDP-FGR, 12 isolated FGR (i-FGR) and 40 controls, randomly sampled from the entire cohort were analysed.

Mean sFlt-1/PlGF and uterine arteries Pulsatility Index (UtA-PI) showed the same trend in all groups, with an average decrease from first to second trimester [-1.71 (95%CI -1.91 to -1.53); -0.85 (95%CI -0.94 to -0.76), respectively], and from first to third trimester [-0.86 (95%CI -1.06 to -0.68); -0.97 (95%CI -1.06 to -0.88), respectively].

In the three trimesters, the longitudinal changes of sFlt-1/PlGF ratio showed a significant increase in HDP-FGR, i-FGR and HDP-AGA groups (1.68, 95%CI 0.84-2.50; 0.49, 95%CI 0.02-0.96; 0.55, 95%CI 0.10-0.97), respectively. Mean UtA-PI showed a significant increase in HDP-FGR and i-FGR groups (+0.27, 95%CI 0.10-0.43 and +0.45, 95%CI 0.16-0.75).

Conclusions. Pregnancies complicated by HDP-FGR and i-FGR show an altered UtA-PI and sFlt1/PlGF ratio as a proxy of placental insufficiency, while HDP-AGA presents an intermediate oxidative stress based on higher sFlt-1/PlGF value.

First trimester screening program for preterm preeclampsia prediction in an Italian obstetric population and aspirin prophylaxis: our preliminary results

Silvia **Andrietti** [1,*], Giorgia **Polizzi** [2,3], Valentina **Musante** [2,3], Mariangela **Cirino** [2,3], Chiara Roberta **Gaggero** [1], Chiara **Calcagno** [1], Diliana **Beleva** [1], Pierangela **De Biasio** [1]

[1] Prenatal Diagnosis and Perinatal Medicine Unit, IRCCS Ospadale Policlinico San Martino, Genoa, Italy.
[2] Academic Unit of Obstetrics and Gynecology, IRCCS Ospadale Policlinico San Martino, Genoa, Italy.
[3] Department of Neurology, Rehabilitation, Ophtalmology, Genetics, Maternal and Infant Health (DiNOGMI), University of Genoa, Genoa, Italy.

DOI: 10.36129/jog.2024.S31

Objective. Our objective was to assess the performance of a combined screening test for preeclampsia in the first trimester and the prophylactic use of low-dose aspirin.

Materials and Methods. Prospective ongoing study of women attending our unit for the first-trimester screening of aneuploidies, between November 2022 and October 2023 (n = 975). Multiple pregnancies and foetal abnormalities were excluded. First-trimester combined screening for preterm preeclampsia was performed using the Fetal Medicine Foundation algorithm, that includes maternal characteristics, biophysical and biochemical biomarkers. High-risk was defined as a risk ≥ 1:150 of preterm preeclampsia (before 37 weeks), in which cases low-dose aspirin (150 mg) was offered to these women from screening until 36 weeks.

Results. From the 975 enrolled participants, the majority were Caucasian (n = 932, 95.6%) and nulliparous (n = 658, 51.7%). 162 patients (16.6%) screened high-risk for preeclampsia, and 95% agreed to start a low-dose aspirin regimen. We analysed obstetric outcomes of the first 300 women enrolled: no cases of early-onset preeclampsia (< 34 weeks) were found; the rate of preterm preeclampsia (< 37 weeks) was 1.6% and total preeclampsia was diagnosed in 2.3% of women compared with 0.5% rate of early preeclampsia and 3.2% of total preeclampsia before the implementation of screening.

Conclusions. There was a lower incidence of early, preterm and total preeclampsia, after the introduction of universal screening and prophylactic use of low-dose aspirin. The association of a first-trimester combined screening model and aspirin prophylaxis appears to be useful in predicting and reducing the incidence of preeclampsia, in a routine care setting.

The role of umbilical vein blood flow assessment in the prediction of foetal growth: a prospective observational cohort study

Daniele **Farsetti** [1,2,*], Moira **Barbieri** [3], Francesca **Pometti** [1,2], Elena **Magni** [4,5], Barbara **Vasapollo** [1,2], Herbert **Valensise** [1,2], Tamara **Stampalija** [4,5]

[1] Department of Obstetrics and Gynecology, Policlinico Casilino, Rome, Italy.
[2] Department Surgical Sciences, University of Rome Tor Vergata, Rome, Italy.
[3] Clinica Mangiagalli, Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico, University of Milan, Milan, Italy.
[4] Department of Obstetrics and Gynecology, Unit of Fetal Medicine and Prenatal Diagnosis, Institute for Maternal and Child Health IRCCS Burlo Garofolo, Trieste, Italy.
[5] Department of Medicine, Surgery and Health Sciences, University of Trieste, Trieste, Italy.

DOI: 10.36129/jog.2024.S32

Objective. To evaluate the umbilical vein blood flow volume (UV-Q) in SGA fetuses and FGR, and to explore the correlation between UV-Q and foetal growth velocity (FGV). Secondly, the capacity of UV-Q and FGV in predicting adverse perinatal outcome (APO) and iatrogenic preterm birth were assessed.

Materials and Methods. 122 women were enrolled (64 SGA and 58 FGR according to Delphi consensus criteria). At the time of diagnosis foetal biometry and Doppler assessment, including absolute UV-Q and normalized for estimated foetal weight (UV-Q/EFW) and abdominal circumference (UV-Q/AC) were considered. The FGV was calculated from the difference between the EFW calculated in two consecutive sonographic evaluations. The pregnancies were followed until delivery and maternal-neonatal outcomes were collected.

Results. When compared to SGA and reference ranges, FGR had significantly lower UV-Q, UV-Q/EFW, and UV-Q/AC. The FGV had a positive significant correlation with UV-Q (r = 0.46), UV-Q/AC (r = 0.43), and BW (r = 0.56).

The multivariable logistic regression analysis showed that UV-Q ≤ 0.65 MoM (aOR = 3.5) and FGV ≤ 0.63 MoM (aOR = 3.0) were independently associated with the occurrence of APO; UV-Q ≤ 0.60 MoM (aOR = 5.2) and FGV ≤ 0.63 MoM (aOR = 3.6) were independent predictors of iatrogenic preterm birth. This was true both for SGA and FGR.

Conclusions. The UV-Q might have a potential role in identifying foetuses with FGR and predicting foetal growth at the subsequent biometric evaluation. UV-Q and FGV are independent predictors of iatrogenic preterm birth and APO in a population of small foetuses, regardless of Delphi consensus criteria. These results encourage future studies on the predictive value of this parameter.

A new angiogenic classification with PlGF and sFlt-1 for hypertensive disorders of pregnancy

Valentina **Giardini** [1,*], Alice Angela Francesca **Santagati** [1], Marco **Casati** [2], Arianna **Pelucchi** [1], Patrizia **Vergani** [1], Anna **Locatelli** [1]

[1] Department of Obstetrics and Gynecology, IRCCS San Gerardo dei Tintori Foundation, University of Milano-Bicocca, Milan, Italy.
[2] Laboratory Medicine, IRCCS San Gerardo dei Tintori Foundation, Milan, Italy.

DOI: 10.36129/jog.2024.S33

Objective. The ratio between two angiogenic markers, sFlt-1 (Soluble fms-Like Tyrosine Kinase-1) and PlGF (Placental Growth Factor), plays a crucial role in managing hypertensive disorders of pregnancy (HDP), notably preeclampsia (preE), aiding in diagnosis and outcome prediction. This study aimed to demonstrate the non-equivalence of sFlt-1/PlGF ratios within current risk categories and suggest a new classification.
Materials and Methods. A retrospective study analysed singleton pregnancies hospitalized for HDP after the 20th gestational week from May 2018 to December 2020. Patients were classified based on the sFlt-1/PlGF ratio (low < 38, medium 38-85/110*, high > 85 or > 110*, and very high > 655 or > 201* – *after the 34th week) and into nine categories respecting PlGF and sFlt-1 levels for gestational age (GA) (within range, above or below).
Results. The cohort comprised 182 patients, with a mean GA at testing of 35+1 weeks (21-41+1) and at delivery of 36+6 weeks (23+3-41+3). Notable categories included Category 6 (PlGF below range-sFlt-1 above range,38%) and Category 1 (both PlGF and sFlt-1 within reference range, 30%). Category 6 patients had the highest risk of adverse outcomes, including premature birth (75%), urgent caesarean section for HDP complications (48%), the necessity of antihypertensive therapy before and after delivery (64 and 67%), a higher percentage of growth-restricted foetuses (59%), and severe clinical presentations (36%).
Conclusions. A new classification system for PlGF and sFlt-1, which considers alterations of each marker relative to GA at testing, improves the management of HDP compared to current stratification. This approach helps to avoid underestimating high-risk cases with a low/medium ratio and enables better stratification of the high-risk category.

Longitudinal maternal bioimpedance analysis in pregnancies complicated by hypertensive disorders and/or foetal growth restriction

Andrea **Caricati** [1,*], Elisa **Sabattini** [2], Lucrezia **Viscioni** [2], Serena **Cerri** [2], Moira **Barbieri** [2], Tatjana **Radaelli** [2], Gabriele **Piuri** [3], Giulia **Privitera** [2], Gabriele **Tinè** [4], Tamara Stampalija [5], Enrico **Ferrazzi** [2], Daniela **Di Martino** [2]

[1] Department of Obstetrics, Gynecology and Neonatology, Unit of Obstetrics and Gynecology, Spedali Civili di Brescia, Brescia, Italy.
[2] Department of Mother, Child and Neonate, Fondazione IRCCS Ca' Granda, Ospedale Maggiore Policlinico, Milan, Italy.
[3] Department of Biomedical and Clinical Science "L. Sacco", University of Milan, Milan, Italy.
[4] Department of Economics and Quantitative Methods, University of Milano-Bicocca, Milan, Iatly.
[5] Department of Obstetrics and Gynecology, Unit of Fetal Medicine and Prenatal Diagnosis, Institute for Maternal and Child Health IRCCS Burlo Garofolo, Trieste, Italy.

DOI: 10.36129/jog.2024.S34

Objective. To study across-pregnancy maternal body composition by bioimpedance analysis (BIA) in pregnancies complicated by hypertensive disorders (HDP) and foetal growth restriction (FGR).

Materials and Methods. Singleton pregnancies, enrolled at the combined first trimester screening test, underwent maternal BIA at each trimester of pregnancy. According to the pre-existing or pregnancy-related occurred complications, women were finally classified distinguishing pregnancies complicated by HDP, isolated FGR (i-FGR), HDP combined with FGR (HDP-FGR) and uneventful pregnancies (controls). A longitudinal Bayesian multivariate mixed-effects model was performed.

Results. In a cohort of 519 patients, 24 cases of chronic hypertension (CH), 19 HDP with appropriate-for-gestational-age foetus (HDP-AGA), 3 HDP-FGR, 12 i-FGR and 40 controls, randomly sampled from the entire uncomplicated pregnancy cohort, were analyzed. Pre-pregnancy body mass index (BMI) was significantly higher in both HDP-AGA and CH than controls. Total body water (TBW), lean body mass (LBM) and visceral fat (VF) showed the same trend in all groups, with an average increase from first to second trimester [+1.84 (95%CI 1.13-2.53); +2.55 (95%CI 1.61-3.50); +0.71 (95%CI 0.06-1.36), respectively], and from first to third trimester [+3.26 (95%CI 2.57-3.97); +4.48 (95%CI 3.56-5.43); +1.27 (95%CI 0.62-1.92), respectively]. No statistically significant differences of TBW, LBM and VF were found among groups, once the bioimpedance parameters were corrected for pre-pregnancy BMI and gestational age at evaluation.

Conclusions. Maternal bioimpedance parameters show a progressive increase across pregnancy in both uncomplicated and pathological pregnancies. Moreover, HDP-AGA and CH are characterized by higher pre-pregnancy BMI, TBW, LBM and VF, a proxy of metabolic syndrome.

Circulating angiogenic factors levels in women with hypertensive disorders of pregnancy (HPD) according to the baseline haemodynamic findings

Beatrice **Valentini** [*], Elvira **Di Pasquo**, Andrea **Dall'Asta**, Maria Grazia **Capurso**, Piernicola **D'Amario**, Valentina Anna **Degennaro**, Alessia **Casciaro**, Tullio **Ghi**

Obstetrics and Gynecology Unit, University of Parma, Parma, Italy.

DOI: 10.36129/jog.2024.S35

Objective. To assess in women with HDP if the predictive value of sFlt-1/PlGF ratio for adverse outcomes is influenced by the haemodynamic phenotype.

Materials and Methods. Retrospective study including a cohort of women with new-onset HDP carrying a singleton viable pregnancy from 22 to 36 gestational weeks. A non-invasive assessment of the main maternal haemodynamic parameters [Cardiac Output (CO), Systemic Vascular Resistance (SVR)] was done upon hospital admission using USCOM-1A. The haemodynamic phenotype was classified as "hypodynamic" in case of low CO [< 5 L/min] and/or high SVR [> 1,400 dynes × s × cm^{-5}] or as "non-hypodynamic" in case of normal or high CO [> 5 L/min] and/or low SVR [< 1,400 dynes × s × cm^{-5}]. The values of sFlt-1 and PlGF were assessed on maternal serum upon hospital admission and their ratio was calculated. An adverse composite maternal outcome (ACMO) was defined in presence of at least one among: severe hypertension or placental abruption or occurrence of end-organ dysfunction as defined by ISSHP guidelines 2021. A composite of adverse neonatal outcome (ACNO) included birth weight below the 10^{th} percentile (small for gestational age), or foetal/neonatal death.

Results. Among the 93 women included, 57(61.2%) were categorized as hypodynamic and 36 (38.8%) as non-hypodynamic. sFlt-1/PLFG ratio at admission was significantly higher in the former group compare with the latter (301 [93.1-787] *vs* 52.5 [10.0-257.0]). A significant association between sFlt-1/PLGF ratio and an ACMO ($p = 0.02$) and an ACNO ($p = 0.007$) was reported only in the group of women defined with a "hypodynamic" profile.

Conclusions. sFlt1/PlGF ratio is associated with the occurrence of an adverse maternal and neonatal outcome only in women with a hypodynamic profile.

Correlation between angiogenetic biomarkers, urinary protein values and ascites in women with hypertensive disorders of pregnancy

Elvira **Di Pasquo**, Beatrice **Valentini** *, Andrea **Dall'Asta**, Stefania **Fieni**, Maria Grazia **Capurso**, Piernicola **D'Amario**, Valentina Anna **Degennaro**, Alessia **Casciaro**, Tullio **Ghi**

Obstetrics and Gynecology Unit, University of Parma, Parma, Italy.

DOI: 10.36129/jog.2024.S36

Objective. To investigate the correlation between sFlt-1/PlGF ratio, the 24-h urinary protein and the presence of maternal ascites in a population of women with new-onset Hypertensive Disorders of Pregnancy (HPD).

Materials and Methods. Retrospective study including a cohort of women with new-onset HDP carrying a singleton viable pregnancy between 22 and 36 gestational weeks. At diagnosis, sFlt-1 and PlGF were assessed using Brahams Kryptor and the ratio was calculated. The amount of proteins on the 24 h urine was also investigated and a value > 5 g/24 h was used to define massive proteinuria. The presence of ascites was defined in if abdominal free fluid was detected at ultrasound examination.

Results. A total of 80 patients were included for the study purpose. A linear correlation was found between the sFlt-1/PlGF ratio and the 24 h urinary-protein values ($R2 = 0.21$; $p < 0.001$). A massive proteinuria was detected in 17 women; sFlt-1/PlGf ratio had an AUC of 0.86 for predicting the presence of massive proteinuria with a cut-off value of 310.9 (sensitivity 88.2%, specificity 71.0%). Ascites was detected in 6 women; significantly higher values of sFlt-1/PlGF ratios were found in this group of women compared with those without ascites (1,322.0 ± 1,083.0 *vs* 423.0 ± 734.0).

Conclusions. Higher values of sFlt-1/PLGF ratios are associated with higher levels of urinary protein and higher incidence of maternal ascites.

Hypertensive disorders of pregnancy as a check point for the diagnosis of chronic kidney disease

Rossella **Attini** [1,*], Massimo **Torreggiani** [2], Giulia **Spanu** [2], Giulia **Chimenti** [2], Anna **Magli** [2], Giorgina Barbara **Piccoli** [2], Bianca **Masturzo** [1]

[1] Gynecology and Obstetrics Unit, Ospedale degli Infermi, Ponderano, Biella, Italy.
[2] Department of Nephrology and Dialysis, Le Mans Hospital Center, Le Mans, France.

DOI: 10.36129/jog.2024.S37

Objective. Although a correlation between hypertensive disorders of pregnancy (HDP) and the possibility of developing end-stage kidney disease during a woman's life is recognized, few studies attempted to quantify the correlation between HDP and the presence of underlying CKD. The objective of our study was to evaluate the prevalence of chronic kidney disease (CKD) in patients who have had an episode of HDP and who underwent a systematic nephrology evaluation.

Materials and Methods. In the context of a multicentre study, patients were enrolled in France (Le Mans) in 2019-2023. HDP and PE were defined according to the 2019 ACOG guidelines. Patients were referred to the local nephrology ward. CKD was diagnosed according to Kidney Disease Outcomes Quality Initiative guidelines.

Results. Three hundred and ninety patients underwent a nephrology work-up, including kidney ultrasounds, an extensive blood and urinary testing, and a dietary evaluation. The median age at nephrology evaluation was 31 years. 73% of patients were white and 27% black; 34% were obese. The prevalence of chronic hypertension was 9.5%. The nephrology evaluation allowed the diagnosis of CKD in 24.4% of cases (95/390), mostly in stage 1.

Conclusions. Pregnancy is an important checkpoint for the diagnosis of CKD and an evaluation after delivery allows a diagnosis of kidney disease in one patient out of four, a prevalence that is remarkably higher that the expects 3% in women in childbearing age. Identifying the initial stages of chronic kidney disease allows implementing early kidney care and are crucial for the follow-up of subsequent pregnancies.

Recurrence of hypertensive disorders of pregnancy in a strictly controlled multidisciplinary follow-up

Bianca **Masturzo** [1], Massimo **Torreggiani** [2], Giulia **Spanu** [2], Giulia **Chimenti** [2], Anna **Magli** [2], Rossella **Attini** [1,*], Giorgina Barbara **Piccoli** [2]

[1] Gynecology and Obstetrics Unit, Ospedale degli Infermi, Ponderano, Biella, Italy.
[2] Department of Nephrology and Dialysis, Le Mans Hospital Center, Le Mans, France.

DOI: 10.36129/jog.2024.S38

Objective. In a 2015 meta-analysis by van Oostwaard of nearly 100,000 patients with a hypertensive disorder of pregnancy (HDP) who had a subsequent pregnancy, the recurrence rate was 20.7% (95%CI 20.4-20.9). However, studies were heterogeneous regarding timing of birth in patients with previous HDP. The aim of our study is to evaluate the prevalence and timing of onset of HDP in a small, strictly followed cohort of patients with previous HDP.

Materials and Methods. The patients were enrolled Le Mans (France) in the period 2019-2023. All patients were prescribed acetylsalicylic acid following a positive pregnancy test and were followed with a multidisciplinary obstetric-nephrological approach.

Delivery was planned if the ACOG criteria for the definition of HDP were met, otherwise a conservative approach was chosen regardless of the appearance of oedema and weight gain, or increase in sFlt-1/PlGF ratio, in the absence of hypertension.

Results. Seventy-four patients with previous HDP were followed-up and 54% of patients (40/74) developed HDP recurrence (16% PE, 29% pregnancy-induced hypertension, 1% HELLP and 8% IUGR). The median gestational age at delivery increased: in previous complicated pregnancies – 33 weeks; in recurrent HDP – 37 weeks, in non-complicated subsequent pregnancies – 39 weeks. Of note, over 50% of recurrences occurred after 37 weeks.

Conclusions. The incidence of recurrence of HDP was high in this strictly followed series of pregnancies after PE; however, most of the cases occurred after 37 weeks, thus raising the question whether a more aggressive approach towards early delivery may limit the risk of HDP recurrence.

Small-for-gestational-age foetuses characteristics and outcome in pregnancies complicated by gestational diabetes

Sara **Nardini** [1,*], Daniele **Farsetti** [1,2], Benedetta **Lupoli** [1,2], Francesca **Pometti** [1,2], Barbara **Vasapollo** [1,2], Herbert **Valensise** [1,2]

[1] Policlinico Casilino, Rome, Italy.
[2] University of Rome Tor Vergata, Rome, Italy.

DOI: 10.36129/jog.2024.S39

Objective. The aim of the study was to define small-for-gestational-age (SGA) foetuses characteristics in pregnancies complicated by gestational diabetes (GDM) and to evaluate the possible underlying haemodynamic changes.

Materials and Methods. We enrolled 112 women with singleton pregnancies complicated by SGA foetuses, 30 of them had GDM while 82 did not. Maternal height and weight were considered at the admission time while haemodynamic assessment with USCOM was performed in both groups in the third trimester before delivery. To assess foetal outcomes, we considered the STv of CTG performed in admission and Foetal Birth Weight.

Results. GDM group had an higher BMI (29.3 ± 6.2 *vs* 25.9 ± 3.9; p = 0.0008), lower STv (7.5 ± 2.9 *vs* 9.4 ± 2.7; p = 0.003) and a lower Foetal Birth weight (2,105 ± 514.2 *vs* 2,350 ± 534.2; p = 0.03) with a higher proportion of PFS < 5° pc (80% *vs* 59.7%; p = 0.05) despite of the non-diabetic group. In pregnancies complicated by GDM there were twice as many cases of hypertension and double the use of nitroderivative therapy. Haemodynamics features were similar in the two groups.

Conclusions. SGA foetuses of diabetic women have a worse outcome risk by presenting at delivery with lower foetal weight and STv both of which data would seem to suggest that in pregnancies with GDM, SGA foetuses have a higher degree of severity than in pregnancies not complicated by GDM.

Italian Journal
of

Gynæcology & Obstetrics

The Official Journal of the
Società Italiana di Ginecologia e Ostetricia
(SIGO)

SIGO
SOCIETA' ITALIANA
DI GINECOLOGIA E OSTETRICIA