First trimester screening of Hypertensive Disorders of Pregnancy: role of uterine arteries Doppler

Anna Luna **Tramontano** [1,*], Lia **Feliciello** [1], Enrica **Perrone** [2], Francesca **Monari** [1], Giliana **Ternelli** [1], Mario **Sarti** [3], Fabio **Facchinetti** [1]

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

[2] Fetal Medicine Unit, Department for Women and Children Health, Careggi University Hospital, Florence, Italy.

[3] Division of Prenatal Diagnosis Center, Piero Palagi Hospital, Florence, Italy.

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

DOI: 10.36129/jog.2022.S13

Objective. Nowadays preeclampsia first trimester screening is not able to predict the different phenotypes of HDP, that are characterized by different times of onset, fetal growth and patterns of uterine arteries (UtA) Doppler velocimetry.
UtA Doppler velocimetry represents a proxy of placental function and provides indirect information regarding placentation process.
We investigated if, in patients at high risk for HDP according to the Fetal Medicine Foundation (FMF) algorithm, the presence of UtA-PI > 95th percentile represents a risk factor for adverse maternal and fetal outcomes.
Materials and Methods. Multicentric retrospective study on 244 patients with high risk FMF preeclampsia screening enrolled at "Piero Palagi" Hospital, Florence and at Careggi University Hospital, Florence.
Patients were divided into two groups: UtA-PI ≤ 95th percentile and UtA-PI > 95th percentile.
Maternal characteristics, maternal and fetal outcomes were compared.
Results. UtA-PI > 95th percentile is significantly associated with Fetal Growth Restriction, severe PE and HELLP syndrome and resulted as a possible risk factor for Apgar index ≤ 7 at 1st minute.
Moreover, smoke habit has been found to be a risk factor, while advanced maternal age, the use of assisted reproductive technology and chronic hypertension unexpectedly resulted protective factors.
Pre-pregnancy BMI resulted irrelevant.

Table 1. *Comparison of maternal characteristics, maternal and neonatal outcome between patients with UtA-PI ≤ 95th percentile and UtA-PI > 95th percentile.*

	Total (n=244)	AU pat (n=51) 20,55%	AU nor (n=193) 79,44%	p value	OR	CI
Age	34,07	32,59	35,54	**0,0003**		
Caucasian ethnicity	231 (94,67%)	49 (96,08%)	182 (94,30%)	0,6151	1,48	0,32-6,90
Smoking habit	11 (4,51%)	5 (9,80%)	6 (3,11%)	**0,0404**	3,39	0,99-11,59
BMI	24,71	24,49	24,92	0,1673		
Chronic hypertension	19 (7,79%)	2 (3,92%)	17 (8,81%)	0,2468	0,42	0,09-1,89
ART	46 (18,85%)	4 (7,84%)	42 (21,76%)	**0,0238**	0,31	0,10-0,90
CS	108 (44,26%)	22 (43,14%)	86 (44,56%)	0,8557	0,94	0,51-1,76
Induction of labour	81 (33,20%)	20 (37,74%)	61 (31,61%)	0,3047	1,40	0,74-2,64
AI ≤7	18 (7,38%)	7 (13,73%)	11 (5,70%)	0,0512	2,63	0,97-7,18
pH	7,26	7,26	7,26			
IUGR	57 (23,36%)	19 (37,25%)	38 (19,69%)	**0,0084**	2,42	1,24-4,73
Gestational hypertension	45 (18,44%)	8 (15,69%)	37 (19,17%)	0,5682	0,78	0,34-1,81
PE/HELLP	9 (3,69%)	5 (9,80%)	4 (2,07%)	**0,0092**	5,14	1,33-19,89

BMI: Body Mass Index; ART: Assisted Reproductive Technology; CS: Caesarean Section; AI: Apgar Index; IUGR: Intra Uterine Growth Restriction; PE: Preeclampsia; HELLP: Hemolysis, Elevated Liver enzymes and Low Platelets

Conclusions. Our study demonstrates that, in patients at high risk for HDP, UtA-PI > 95th percentile is associated with worse maternal and fetal outcomes. These data should guide clinicians in the management of pregnancy, suggesting a more intensive clinical and ultrasonographic follow-up in order to identify the onset of complications early on and to optimize therapeutic strategies.

Copyright 2023