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Role of Colour Doppler in Pregnancyinduced Hypertention

KEYWORDS: Colour Doppler, Pulsatile Index, Resistance Index, Pregnancy induced hypertension, S/D ratio

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ABSTRACT *Pregnancy induced hypertension is one of the major killer disease of the neonate and pregnant, so timely and perfectly performed. Colour Doppler velocinetry can differentiate the foetuses which are at jeopardy. Where in by detecting the Doppler changes we can improve the maternal and fetal survival to the large extent. This intern can save the millions and millions of national budget spent on the unnecessary complication of PIH.*

OBJECTIVES:
To evaluate the role of color Doppler in Pregnancy Induced Hypertension.

METHODS:
Sixty (60) patients diagnosed to have PIH with gestational age beyond 30 weeks were studied and subjected to colour Doppler ultrasonography.

Uterine, umbilical and fetal middle cerebral arteries were studied. S/D ratio of more than 2.6, RI more than 0.58, persistent early diastolic notch in uterine artery; S/D ratio of more than 3, RI more than 0.7, AEDV, REDV in umbilical artery; RI less than 0.7, PI less than 1.3 in middle cerebral artery were considered abnormal. The results were correlated with parameters of perinatal outcome.

PROCEDURE:
The patient was explained about the non invasive/atraumatic nature of the procedure. Examination is performed with the patient in supine position with slight left lateral tilt. Synthetic ultra gel is applied liberally over the abdomen to get a good acoustic coupling.

Initially routine scan is performed using 2-D real time ultrasound with 3.5 MHZ convex sector transducer. Machine used in radiology department is ESOATE MEGAS GPX. Doppler wave form was obtained after localizing the vessels by B-mode real time scanner. Pulsed Doppler was used to get Doppler signals after localizing the vessels. The maximum Doppler Shift frequencies were obtained and various ratios were calculated from each vessel. Doppler examination was done when the fetus was in apneic state to avoid the influence of fetal respiration on Doppler signals.

Identification of various arteries and their criteria:
Uterine artery: colour Doppler facilitates identification of uterine artery substantially. The uterine signals were obtained per abdomen by pointing the probe in the iliac fossa towards the lower para-cervical area. In the colour mode uterine artery is seen to cross the external iliac artery, just after its origin from the internal iliac artery and this point was taken as sampling point. S/D ratio more than 2.6, RI more than 0.58 and persistent early diastolic notch is considered abnormal.

Umbilical artery: Flow velocity wave forms from umbilical artery can be easily obtained, for this colour flow is not usually needed. Doppler signals can be acquired from different points in cord usually from mid portion of card. S/D ratio of umbilical artery more than 3, RI more than 0.7, presence of absent end diastolic velocity (AEDV) and reversal end diastolic velocity (REDV) were considered abnormal.

Middle cerebral artery (MCA): MCA was visualized in transverse axial view of fetal head at a slightly more caudal plane than the one used for BPD. PI less than 1.3 and RI less than 0.7 were considered abnormal.

RESULTS:
Out of 60 cases studied, 35 (58%) had abnormal indices and the rest 25 (42%) cases were normal. 30 (85%) out of 35 abnormal cases had umbilical artery S/D ratio of more than 3. Among abnormal cases, 26 babies (74%) had APGAR score <7 compared to 5 babies (20%) in normal cases ($p<0.001$).

22 babies (63%) with abnormal Doppler had NICU stay, out of which 14 (64%) had stay for more than 1 week.

Out of six patients with AEDV, there were two still born, two neonatal deaths and another two recovered in NICU accounting to 66.66% mortality in AEDV cases.

DISCUSSION:
Hypertensive disorder of pregnancy constitutes the commonest medical disorder diagnosed by obstetrician in clinical factors. It is well recognised that the attendant maternal and neonatal morbidity and mortality is substantial.

Knowledge gained from the use of Doppler velocimetry of umbilical and middle cerebral artery can distinguish between fetus that can be safely managed conservatively from the fetus really at risk of perinatal morbidity and mortality, who is lightly to benefit from earliest delivery, thus having a beneficiary role in the management of high risk pregnancies.

In the present study out of sixty pregnancy induced hypertension cases 35 showed positive Doppler indices in any of the three vessels studied the remaining 25 cases showed normal Doppler indices in all the three vessels studied.

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CONCLUSION:

Doppler velocimetry is a primary tool for fetomaternal surveiliance and indispensable for the management of pregnancy induced hypertension patients.

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