

Assessment of placental volume and vascularization by three-dimensional power Doppler ultrasound at 11 to 14 weeks of gestation in a Taiwanese population

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Objective

To evaluate the placental volume and vascular indices during 11 to 14 weeks of gestation in a Taiwanese population.

Methods

From June 2006 to September 2009, three-dimensional power Doppler ultrasound was performed in 222 normal pregnancies from 11 to 14 weeks of gestation. Power Doppler was applied to the placenta and placental volume (PV) was obtained by the rotational technique (VOCALTM). In each case, the 3D-power histogram was used to assess the placental vascular indices, including mean gray value (MGV), vascularization index (VI), flow index (FI) and vascularization-flow index (VFI). The placental vascular indices were then plotted against gestational age (GA) and PV.

Results

Our results showed that the linear regression equation for PV by using gestational week as independent variable, was $PV = 18.852 \times GA - 180.89$ ($r = 0.481$, $p < 0.05$). All placental vascular indices showed constant distribution throughout 11 to 14 gestational weeks. A tendency for a reduction in placental mean gray value with gestational weeks was observed, but without statistical significance.

Conclusion

All placental vascular indices estimated by 3D power Doppler ultrasonography presented constant distribution throughout gestation.