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Growth patterns of term diabetic and non-diabetic pregnancies: A case-control study

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Objective

The primary objective of this study is to determine the effect of diabetes and the management approaches for mother and fetus on fetal growth. Universal diabetes screening is performed between 24-28 weeks by using the 2-hour 75gr Oral Glucose Tolerance Test (OGTT). Glucose management is achieved by combination of diet, exercise and insulin administration, while induction is offered at 38 weeks for insulin users and at 39 weeks for non-insulin users. Serial ultrasound growth measurement is carried out at 28, 32 and 36 weeks. Non-diabetic, normotensive pregnancies are offered a 36-week growth ultrasound and induction of labour at 41 weeks.

Methods

This is a prospective case-control study carried out between Jan 01 2014 and Dec 31 2015 at the Archbishop Makarios III Hospital in Nicosia (Cyprus) recruited 167 diabetic and 83 non-diabetic normotensive singleton, term pregnancies. Customized growth charts were used for fetal and birth weight determination by using the Hadlock Formula. Estimated fetal weight (EFW) below the 10th centile was classified as small for gestational age (SGA), between the 10-90th as adequate for gestational age (AGA) and above the 90th centile as large for gestational age (LGA).

Results

Diabetic pregnancies have a mean birth weight of 3058. 96 gr and a mean birth age of 38. 33 weeks (40th centile). SGA is found in 21% of cases while AGA is found in 71. 25% and LGA in 7. 78% of cases. Distribution of AGA neonates are 22. 75% (11-25th), 25. 15% (26-50th), 16. 76% (51-75th) and 6. 58% (76-90th) centile. Gestational age at birth is 37 weeks, 38 weeks, 39 weeks and 40 weeks for 19. 97%, 44. 31%, 32. 93% and 7. 78% respectively. Non-diabetic pregnancies have a mean birth weight of 3250. 95gr and a mean birth age of 39. 03 weeks (40th centile). SGA is found in 19. 27%, while AGA in 78. 33% and LGA in 2. 40%. AGA distribution is 20. 48% (11-25th), 33. 73% (26-50th), 13. 25% (51-75th) and 10. 84% (76-90th) centile. Gestational age at birth is 37 weeks, 38 weeks, 39 weeks and 40 weeks for 8. 43%, 21. 68%, 27. 7% and 42. 16%, respectively.

Conclusion

Diabetic pregnancies have a mean birth weight of 3058. 96 gr and a mean birth age of 38. 33 weeks (40th centile Diabetic and non-diabetic pregnancies have non-significant difference in SGA incidence while there is significant difference in LGA incidence (7. 78% vs 2. 40% respectively). Among the AGA cases, there are non-significant differences among the 51-90th centile cases as well. Mean birth weight is slightly higher in non-diabetic pregnancies than diabetic but this can be explained by the earlier gestational age at birth, as both are approximately on the 40th centile for age. Overall, universal screening for diabetes and implementation of a glucose (diet, insulin) and fetal monitoring protocol (serial scans, induction of labour), has shown to decrease the risk of macrosomia and adverse effects in diabetic pregnancies.