Short umbilical cord – a risk factor for placental abruption?

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Objectives:
Many complications of pregnancy and delivery are related to umbilical cord length. The objective of this study was to examine the association between umbilical cord length and placental abruption according to gestational age.

Methods:
Birth register data of 47,284 singleton pregnant women delivering live-born newborn in Kuopio University Hospital, Finland was collected prospectively from March 1989 through June 2011. For this data we have recently published gender- and sex-specific centile charts for cord length from 22 to 44 gestational weeks [1]. We have also examined the relation of cord length and placental abruption by taking into account several gestational, fetal, and maternal factors with multiple regression analysis. The factors were: gestational age, gender, birth weight, placental weight, maternal age at delivery, marital status, pregravid BMI, parity, pregravid smoking (> 5 cigarettes /day), smoking during pregnancy (> 5 cigarettes /day), alcohol consumption during pregnancy, self-reported infertility, previous miscarriages, previous abortions, maternal pregravid diabetes mellitus, maternal chronic disease, gestational diabetes mellitus, preeclampsia, velamentous cord insertion, and placenta praevia. Based on the results of our previous study, we have now investigated further the association between cord length and placental abruption according to gestational age. The effects of placental abruption and gestational age as well as their interaction were examined with the use of two-way analysis of variance (ANOVA).

Results:
Our previous study showed that gestational age at birth, birth weight, placental weight, pregravid maternal body mass index, parity, and maternal age correlated to cord length. Gestational diabetes and previous miscarriages were associated with longer cords, while female gender and placental abruption were associated with shorter cords.

According to the multiple linear regression analysis cord length was about 4.7 cm shorter in the case of placental abruption, which suggests a relatively strong association. The incidence of placental abruption was 0.6% in our data. The mean cord length was 49.7 cm (SD 15.3) among the cases with placental abruption compared to 59.1 cm (SD 13.0) (p<0.001) without placental abruption. In order to observe closer the influence of gestational age the incidences of placental abruption were defined in subgroups: 15.9% (n=21), 9.2% (n=56), 3.8% (n=68), 0.3% (n=141), and 0.3% (n=7) at 22-27, 28-33, 34-36, 37-41, and 42-44 gestational weeks, respectively. The mean cord lengths among the cases of placental abruption were smaller in all gestational age groups (36.6 cm (SD 9.3), 42.3 cm (SD 9.2), 50.4 cm (SD 11.4), 53.8 cm (SD 12.5) and 59.4 cm (SD 13.6)) compared to the cases without placental abruption (43.1 cm (SD 11.0), 47.8 cm (SD 12.4), 53.4 cm (SD 12.9), 59.4 cm (SD 12.9) and 61.1 cm (SD 13.3)) (p<0.001). Notably, the interaction term was not found statistically significant.

Conclusion:
The results support our previous finding that the placental abruption associates with short umbilical cord independently of the gestational age at birth. However, due to substantial variation in cord length within every gestational age we cannot exclusively conclude that short umbilical cord is an independent risk factor of placental abruption. This association still requires further investigation.

References:

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