The influence of maternal and neonatal characteristics on fetomaternal hemorrhage in normal vaginal delivery

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AIM OF THE STUDY

Determine the influence of maternal age, parity, blood group, gestational age and birth weight on the volume of fetomaternal hemorrhage (FMH) in normal vaginal delivery. Determination of these variables would enable optimalization of guidelines for RhD alloimmunization prophylaxis.

WORKING HYPOTHESIS

Immunoglobulin (Ig) G anti-D in a dose of 10 μg administered intramuscularly should cover 0.5 mL of fetal RhD positive red blood cells (RBCs) or 1mL of whole fetal blood. FMH is fetal RBC volume; fetal blood volume is double (expected fetal hematocrit is 50%). In the great majority of normal vaginal deliveries, less than 2.5 mL of fetal RBCs (5 mL of whole fetal blood, sufficient dose of IgG anti-D 50 μg) enter the maternal circulation. Contrarily, only rarely does FMH exceeding 5 mL (10 mL of whole fetal blood, sufficient dose of IgG anti-D, 100 μg) occur and **maternal age, parity, blood group, gestational age and birth weight do not present a risk factor**.

METHODS

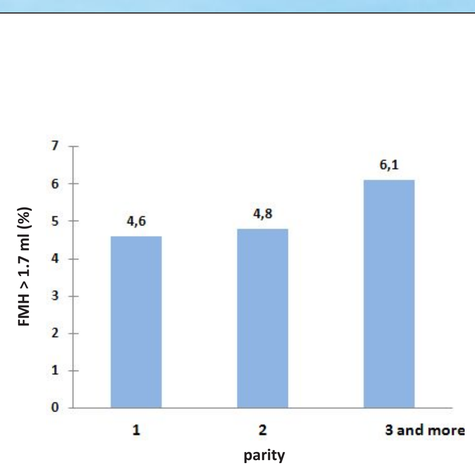
In a prospective cohort study, a total of **3295** examinations were performed after normal vaginal delivery. FMH was assessed by flow cytometry. (FMH is fetal red blood cell [RBC] volume; fetal blood volume is double [expected fetal hematocrit is 50%]).

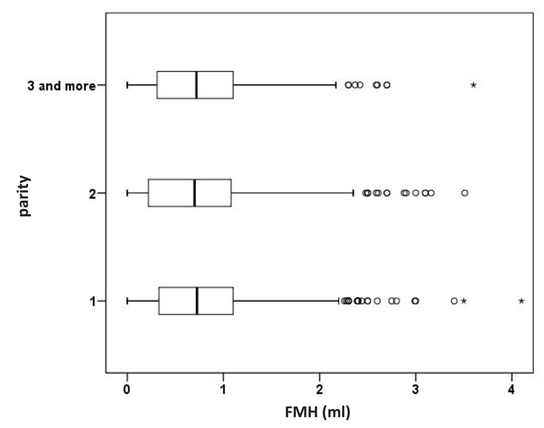
RESULTS

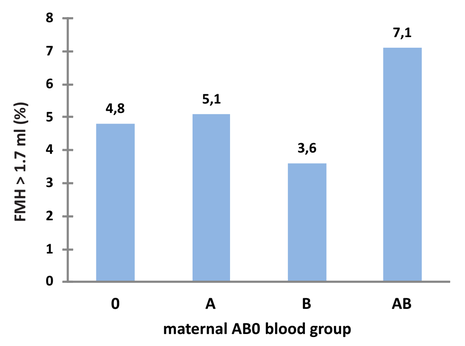
The fetal RBC volume diagnosed in maternal circulation after normal vaginal delivery ranged from insignificant FMH ≤ 0.1 mL to excessive FMH = 65.9 mL (median, 0.7; mean, 0.77; SD, 1.61). FMH > 2.5 mL (immunoglobulin [Ig] G IgG anti-D insufficient dose **50 μg**) was observed in **1.0%** (34/3295) and excessive volumes of FMH > 5mL (insufficient dose, **100 μg**) in **0.21%** (7/3295). The influence of maternal age, parity, blood group (AB0, RhD), gestational age and birth weight on FMH (> 1.7 mL, 95.0 percentile; > 2.0 mL, 97.5 percentile; > 2.5 mL; > 5 mL) was not statistically significant.

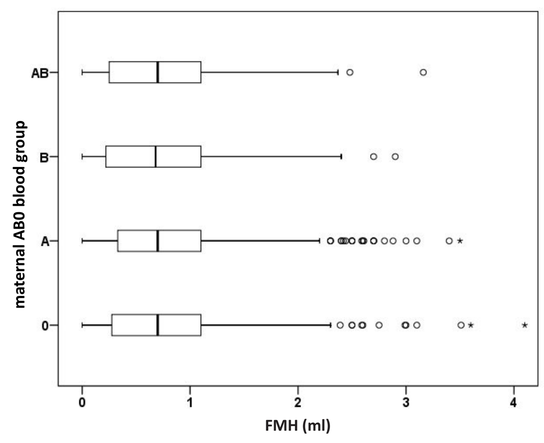
CONCLUSION

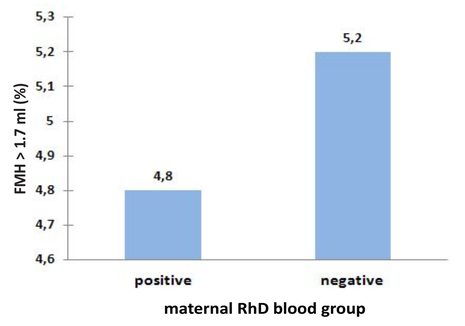
During normal vaginal delivery FMH of less than 5 mL occurs in the great majority of cases, and thus for the prevention of RhD alloimmunization, **an IgG anti-D dose of 100 μg should be sufficient**. Contrarily, only rarely does greater FMH occur and maternal age, parity, blood group, gestational age and birth weight do not present a risk factor.

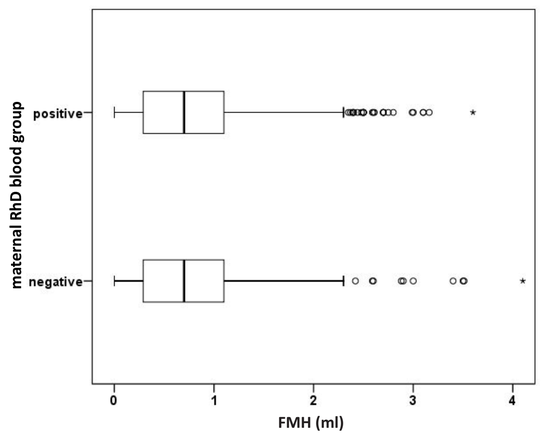


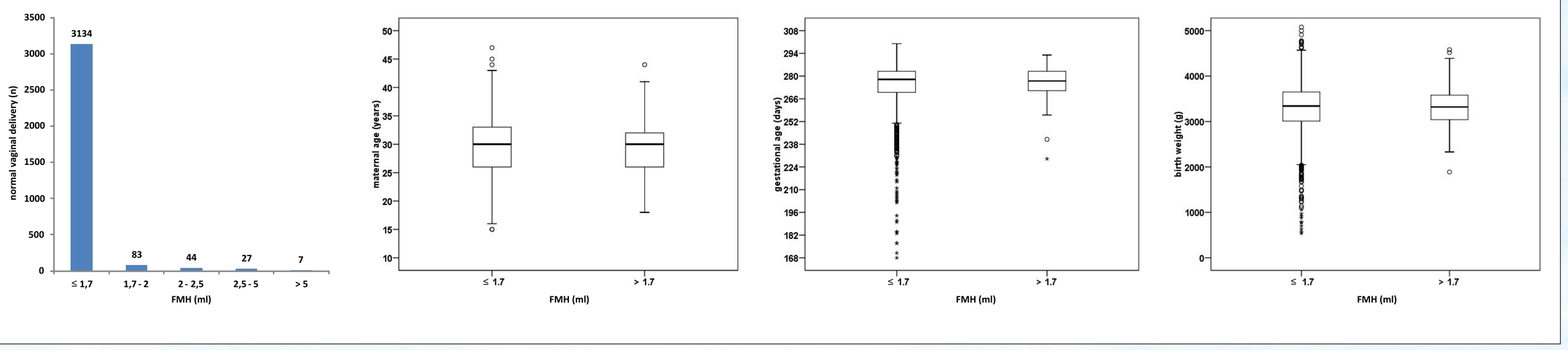












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