Effect of delayed cord clamping on neonatal bilirubin levels, jaundice, phototherapy and polycythemia. Systematic review and meta-analysis

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INTRODUCTION

Hyperbilirubinemia is considered a potential disadvantage of delayed cord clamping (DCC). Due to increased volume of neonatal blood after DCC, the risk of neonatal jaundice and polycythemia increases too [1]. Because of that, The American College of Obstetricians and Gynecologists recommends delaying cord clamping at least 30 – 60 s after the birth under a well-established monitoring and treatment system for neonatal jaundice [2].

AIM

To assess the effect of delayed cord clamping on bilirubin levels, neonatal jaundice, polycythemia and the necessity of phototherapy.

METHODS

The approval (No.: BEC-MF-201) was granted by the Centre for Bioethics of LUHS. This systematic review and meta-analysis adhered to the PRISMA statement. Four databases were searched - PubMed, Cochrane Library, EMBASE and Oxford Academic Journals. Keywords included „delayed cord clamping“, „early cold clamping“, „bilirubin“, „jaundice“, „hyperbilirubinemia“, „polycythemia“. Inclusion criteria - randomized controlled trials, access to full-text articles. Conference abstracts, systematic reviews, case reports, meta-analyses were not included in this review. Statistical analysis was performed using Review Manager version 5.4. Standard mean differences and fixed effect were selected for meta-analysis. Cochran’s Q test and Higgins’ I^2 were used to assess the heterogenicity of the study.

RESULTS

21 articles that met the criteria were found [1,3-22]. Most of the trials included healthy women (except 1 trial with HIV-positive women and 2 with diabetes mellitus) with both mature and premature pregnancies. Results show that DCC increases the levels of bilirubin (SMD -0.06, 95% CI -0.09 to -0.03, P <0,00001), increases the risk of neonatal jaundice (SMD 1.57, 95% CI 1.40 to 1.75, P < 0,0001) and polycythemia (SMD 3.03, 95% CI 2.38 to 3.84, P < 0,0001). However, there is no significant difference in the need for phototherapy between groups (SMD 1.07, 95% CI 0.98 to 1.17, P = 0,14).

CONCLUSIONS

DCC increases the levels of bilirubin, the risk for it to result in hyperbilirubinemia and the number of neonatal jaundice cases. However, even with the increased number of jaundice cases, DCC does not increase the need for phototherapy. It makes DCC a reasonably safe method to use in the prevention of newborns anemia. Although, DCC also increases the risk of polycythemia, so neonathologists should be aware of performed DCC.