Is Prematurity A Risk Factor for Development Dysplasia of the Hip? A Systemic Review and Meta-Analysis

Ryan McNassor, Robert John Burkhart, Alexander Joseph Acuña, Atul F Kamath[1]
[1]Cleveland Clinic

INTRODUCTION: Developmental dysplasia of the hip (DDH) is the most common orthopaedic disorder in newborns. Early diagnosis is critical to prevent hip osteoarthritis and severe functional limitations in young adults. While several risk factors including breech position, female sex, and family history have been identified, the association between prematurity and DDH remains unclear. Our analysis sought to analyze the available literature exploring the relationship between prematurity and DDH.

METHODS: PubMed, EBSCO host, Medline, and Google Scholar electronic databases were utilized to identify articles evaluating prematurity and DDH published between January 1st, 2000 and February 1st, 2022. All identified articles were independently assessed by two reviewers with a third reviewer in cases of disagreement, following PRISMA guidelines. Initial query yielded 649 publications, with 50 selected for full-text review and 11 fulfilling our inclusion and exclusion criteria. Meta-analysis was conducted when two or more articles reported data regarding the same outcome measure.

RESULTS: Overall, a total of 8,720 patients with 4,552 males (52%) and 4,168 (48%) females were included (**Table 1)**. The gestational age ranged from 23-36 weeks for preterm and ≥ 37 weeks for term. Seven of the included studies demonstrated that gestational age did not have a significant impact on DDH. A pooled analysis of available data demonstrated no significant difference in DDH among preterm and term infants (OR, 1.11; 95% CI, 0.82-1.51, *p*=0.49) (**Figure 1)**. Sub-group analysis of two studies reporting data on very preterm (≤32 weeks) and term infants revealed no significant difference in occurrence of DDH (OR, 4.58; 95% CI, 0.09-244.78, *p*=0.45) (**Figure 2)**. Four studies found early gestational age to be associated with a significantly higher incidence of mature hips compared to late preterm or term babies. Pooled analysis demonstrated significantly lower Graf classification among preterm infants (OR, 0.13; 95% CI, 0.03-0.61, *p*=0.009) (**Figure 3)**.

DISCUSSION AND CONCLUSION:

The majority of available studies demonstrated no association between prematurity and the rate of DDH. Our pooled analysis of all studies likewise showed no association. Current recommendations are for ultrasound screening in infants at high risk for DDH, and the findings of our study suggest that prematurity in isolation would not warrant ultrasound assessment of the hip. Furthermore, our pooled analysis showed that prematurity was associated with increased hip maturity. This is hypothesized to be related to decreased intrauterine restrictions for premature infants or possibly related to decreased exposure to maternal hormones, however this requires further investigation.