Is stallion age related to dystocia or neonatal foal morbidity?

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With advancing age, males have a nonlinear increase in germ line mutations related to cumulative changes in spermatagonial stem cells. These effects result from age related changes that compromise DNA replication, DNA repair, cell cycle control and epigenetic modifications. These errors accumulate with successive mitotic divisions and contribute to de novo mutations, affecting genetic traits in a variety of ways. Objective was to evaluate if older stallions were more likely to sire foals involved in dystocia or affected by neonatal morbidity. Records from 2014 to 2018 were retrieved from 2 veterinary referral practices (Hagyard Equine Medical Institute and Rood & Riddle Equine Hospital). Thoroughbred mares admitted for dystocia and Thoroughbred neonatal foals admitted for any illness were identified. Expected age-related admission rates were estimated using state wide Thoroughbred foaling records. Stallion age was divided into 4 groups: < 10, 10 - 14, 15 - 19, and 20 plus years. Odds ratios for admission by stallion age group were estimated using a Bayesian modeling approach, with stallion age of < 10 years as baseline. Neonatal foals sired by stallions aged 15 - 19 years and 20 plus years were significantly more likely to be admitted to veterinary hospitals with odds ratios (95% credibility intervals) 1.28 (1.05, 1.56) and 1.65 (1.04, 2.51), respectively. Dams carrying foals sired by stallions aged 20 plus were significantly more likely to be admitted for dystocia with odds ratio (95% credibility interval) of 2.07 (1.10, 3.58). There is considerable potential to study both dystocia and neonatal foal morbidity as functions of stallion age and, more specifically, male germ line mutations. An equine model could provide considerable potential to study biology of male germ line mutations, as stallions often continue to breed well into advanced age; furthermore, accurate records are available to identify large numbers of specific stallion offspring (large families).

Keywords: Stallion age, dystocia, foal morbidity