Changes in flow Doppler indexes of the testicular artery in peri-pubertal donkeys

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Testicular growth and onset of spermatogenesis are dependent on the hormonal changes occurring during the peri-pubertal period. Puberty can be considered achieved when a threshold number of motile spermatozoa in the ejaculate is present. Doppler ultrasonography allows to study testicular perfusion, which might be related to testicular function: in humans, resistivity index is lower in adults compared to pre-pubertal children. The aim of this study was to evaluate in peri-pubertal donkeys some blood flow indexes of the testis. Four Amiata donkeys were subjected to flow Doppler examination of the testicular artery at the sopratesticular (STS) position every two months between 8 and 24 months of age. Pulsatility and resistivity indexes (PI and RI, respectively) were evaluated. Semen collection was attempted every 20-30 days from 12 months of age, and puberty was considered attained when an ejaculate with $>50x10^6$ spermatozoa with >10% motility was collected for the first time. Both indexes were affected by age ($P<0.01$): PI was significantly higher at 14 months compared to 24 months (median[IQR]: 4.76[1.77] and 1.69[0.21], respectively, $P<0.01$), and the same occurred for RI at 12 and 14 months compared to 24 months (1.07[0.03] and 1.08[0.16] versus 0.77[0.02], $P<0.01$). Puberty was reached by one donkey at 19 months and by the other three at 20 months. Mean RI of right and left STS evaluations was <1 in none, two, three and four donkeys at 14, 16, 18 and 20 months, respectively. These results, although on a small number of animals, showed that puberty was associated with a decrease of PI and RI, as described in humans.