

Relationships between testicular blood flow, sperm output and sperm quality in stallions

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In the last year first reports about testicular blood flow in stallions were published. In human medicine there is some evidence of a relationship between testicular perfusion and sperm quality. The aim of this study was to examine if there are correlations between testicular blood flow, sperm output and sperm quality in breeding stallions.

Investigations were carried out on 53 fertile warmblood stallions (age: 9.3 ± 4.5 yr) taking part in a commercial breeding program. Blood flow volume (BVOL) and Pulsatility Index (PI) in both testicular arteries were examined once during the breeding season using a colour Doppler ultrasonograph with a 7.0-MHz microconvex-probe. Pulsatility Index is an index of resistance to flow distal to the point of sampling. The higher the value the greater the resistance and vice versa. For evaluation of sperm output and sperm quality, following parameters were used: total sperm number per ejaculate, frequency and interval of sperm collections and percentage of motile sperm. As there were correlations between BVOL ($r = 0.46$; $P < 0.001$) and PI ($r = 0.60$; $P < 0.0001$) of the left and right testicles, mean values of both sides were used for subsequent analyses. Mean BVOL ranged from 4 to 51 ml/min (15.6 ± 9.0 ml/min) and mean PI from 0.76 to 5.87 (2.50 ± 1.13) for stallions. No relationship could be observed between BVOL and PI ($P > 0.05$). PI ($r = 0.35$; $P < 0.01$), but not TAMV ($P > 0.05$) were related to age of stallions. Between parameters of testicular blood flow, sperm output and sperm quality no significant correlations ($P > 0.05$) could be observed.

The results show that in fertile stallions there is high individual variation in testicular blood perfusion, which is related neither to sperm output nor to sperm quality of the testicles. In ongoing studies we are investigating if testicular blood perfusion indicates pathological conditions in stallions.

Keywords: testicular artery, blood flow, Doppler, stallion, fertility