

## **P010: The role of vasopressin in human sperm function**

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**Background:** Neuropeptides play an essential role in reproduction, with many of their receptors found throughout both male and female reproductive tracts (1). Vasopressin (VP), with a key role in homeostasis, is also important in regulating reproductive behaviours (2). Though two relatively old studies have detected VP in human and Bull semen little is known about its possible role in human sperm function (1, 3, 4). The present study aims to explore the role of VP on human sperm function.

**Methods:** Semen samples were obtained from consenting males following NHS and Faculty approval. Vasopressin receptor 2 (VPR2) expression on sperm was analysed via immunostaining and seminal plasma vasopressin concentrations detected by ELISA. Sperm motility and kinematics were measured via CASA (SAMI). Sperm calcium measurements were carried out using fluorescent microplate assays. Acrosome-reacted sperm were detected using SEM. Aquaporin-2 (AQP2) expression in sperm was detected using dot blots and western blots.

**Results:** We confirm the presence of VP in human semen; at concentrations of 143.4 -- 2827.9 pg/ml (n = 74). VPR2 was found localised to the sperm acrosomal region. Treatment of human sperm with desmopressin and VP significantly modulated motility, linearity and curvilinear velocity ( $p < 0.05$ ) and induced a significant calcium response ( $p < 0.05$ ). VP-treatment led to a 3-fold increase in acrosome-reacted sperm (Vehicle 1.8%, VP 6.2%). Both glycosylated and non-glycosylated isoforms of AQP2 were found in untreated, vasopressin treated and capacitated sperm.

**Conclusions:** The variations in semen VP concentrations, together with sperm responses to VP and agonist treatments and the occurrence of VPR2 and AQP2 in human sperm suggests a possible mechanistic role of VP in sperm function. Further work is needed to understand the role of VP in fertility and the potential use of VP as a biomarker of reproductive health.

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