The link between chronic musculoskeletal pain and sperm quality in overweight orthopedic patients

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Aims: The association between low fertility potential and an overweight is well recognized. In addition, a link between pain and overweight condition has been identified. However, it is not known whether overweight pain patients present any alterations in fertility potentials. Hence, the current study provided a profounder vision into the possible relation between an overweight condition, chronic musculoskeletal pain, and fertility potential in overweight male patients.

Methods: This "observational study" was based on 10 overweight chronic pain patients (OP and 10 healthy matched controls (OC) from the referrals to the orthopedic department at Aalborg University Hospital, Aalborg, Denmark. The study was approved by the regional Ethics Committee of the Northern Jutland, Denmark and conducted from June 2014 to December 2015. Semen samples were obtained from all participants and assessed for sperm concentration, motility, and kinematic parameters with the Sperm Class Analyzer (SCA®, Spain). Pressure pain thresholds (PPT) were also measured by a handheld pressure algometer in 16 pre-defined points of the subjects in both groups.

Results: The OP group demonstrated a decline in PPT values compared to the (OC); however, difference between the two was insignificant. But, the OP group showed a lower percentage of static and non-progressive motile sperm ($P < 0.05$). The sperm kinematic parameters (progressive motility, VCL, VSL, VAP and BCF) also demonstrated a lower trend in OP group in comparison with the controls.

Conclusions: This study presented that sperm quality declines in overweight chronic pain patients. Since the control group consisted of pain free overweight individuals, we propose that chronic musculoskeletal pain could potentially affect sperm quality, distinct from what an overweight alone does to the male fertility potential. However, further investigation in overweight chronic pain patients of different types is required before a general conclusion can be made. In addition, mechanisms underlying such effects need further clarification.

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Several days of muscle hyperalgesia facilitates cortical somatosensory excitability

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Background and aims: Maladaptive plasticity in neural circuits has been proposed in chronic musculoskeletal pain and has been discussed as a key component of the transition from acute to chronic pain. The induction of delayed onset muscle soreness (DOMS) in healthy individuals is one method that can be used to investigate the adaptations of neural circuits in response to several days of muscle hyperalgesia. The aim of this study was to determine the adaptations of the sensory cortex in response to muscle hyperalgesia induced by eccentric exercise of the wrist extensor muscles. It was hypothesized that muscle hyperalgesia would result in a facilitation of cortical somatosensory excitability, based on sensory evoked potentials evoked by electrical stimulation of the radial nerve.

Methods: Twelve healthy subjects performed eccentric exercise of the wrist extensors. Muscle soreness, pressure pain thresholds (PPTs) on the extensor carpi radialis (ECR) muscle, somatosensory evoked potentials (SEPs) based on 10 channel EEG recorded during electrical stimulation of the radial nerve were recorded before (Day0Pre), 2 h (Day0Post), 2 days (Day2), and 6 days (Day6) after exercise.

Results: Compared to Day0Pre: (i) Muscle soreness increased at Day0Post and increased further at Day2 (both $P < 0.05$). (ii) Pressure pain thresholds decreased at Day2 ($P < 0.05$), (iii) the peak-to-peak N30-P45 and P45-N60 amplitude of the sensory evoked potential from the central-parietal recording sites were increased at Day2 (both $P < 0.05$); (iv) reduction in ECR PPTs was correlated with an increase of the post-central P45 wave.

Conclusions: These data demonstrate that hyperalgesia developing across several days is accompanied by an increase in sensory cortical excitability. In addition, sensory cortical adaptation followed a similar temporal profile to increased sensitivity to pressure (PPTs). This model may be relevant for further understanding neural adaptation in the transition from acute to chronic pain.

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Social stress, epigenetic changes and pain

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Aims: Bullying is a prevalent issue in society, with adverse effects ranging from psychological symptoms to somatic ailments like chronic pain. The purpose of this study was to generate new knowledge about the underlying mechanisms behind this association. Using an animal model, we investigated the changes in microRNA expression in plasma, in the pituitary gland and the adrenal gland following social stress.

Methods: A resident-intruder paradigm where male Sprague Dawley rats (intruders) were exposed to male Long Evans rats