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This newsletter is quarterly and contains abstracts from medical journals published between March and June 2004 (abstracts presented at scientific meetings may also be included). Please direct any comments regarding this newsletter to chris@nva.org.

Vulvodynia / Pain

Immunoglobulin E antibodies to seminal fluid in women with vulvar vestibulitis syndrome: Relation to onset and timing of symptoms.

Babula O, Bongiovanni AM, Ledger WJ, Witkin SS

American Journal of Obstetrics and Gynecology, Vol 190, Issue 3, March 2004, Pages 663-7

Objective: Patients with vulvar vestibulitis syndrome and control subjects were tested for evidence of allergy to seminal fluid to differentiate women with a clinical diagnosis of vulvar vestibulitis syndrome into discrete categories. Study design: Plasma samples from 52 women with vulvar vestibulitis syndrome and 43 control subjects were tested for immunoglobulin E antibodies to seminal fluid, total immunoglobulin E, interleukin-4, and interleukin-12 by enzyme-linked immunosorbent assay. Demographic and medical histories were obtained by questionnaire and interview. Results: Sixteen of the patients (30.8%) with vulvar vestibulitis syndrome and 2 control subjects (4.7%) tested positive for immunoglobulin E antiseminal fluid. Symptoms began after sexual intercourse in 43.8% of the women who tested immunoglobulin E positive and 11.1% of the women who tested immunoglobulin E negative ($P = .02$). Symptom initiation after a yeast infection was reported by 31.3% of the women who tested immunoglobulin E positive and by 2.8% of the women who tested immunoglobulin E negative ($P = .008$). Other symptom-initiating events were reported by 47.2% of the women who tested immunoglobulin E negative and by none of the women who tested immunoglobulin E positive ($P = .0008$). Fifty percent of the women who tested immunoglobulin E positive, as opposed to 22.2% of the women who tested immunoglobulin E negative, reported pain only after intercourse ($P = .05$). Pain at other times occurred in 50% of the women who tested immunoglobulin E positive and in 72.2% of the women who tested immunoglobulin E negative ($P = .001$). There was no relation between immunoglobulin E antiseminal fluid and total immunoglobulin E, interleukin-4, or interleukin-12. Conclusion: A subset of women with vulvar vestibulitis syndrome are sensitized to seminal fluid, and an allergic reaction to seminal fluid may be associated with the initiation and persistence of their symptoms.

A new instrument for pain assessment in vulvar vestibulitis syndrome.

Pukall CF, Binik YM, Khalife S

Vulvar vestibulitis syndrome (VVS) is a common form of dyspareunia in premenopausal women. The standard test for diagnosing VVS is the cotton-swab test, during which a cotton-swab is applied to various locations of the vulvar vestibule. However, there is much variation in the implementation of this test relating to the precise vestibular locations palpated, the order of palpation, and the force used during palpation. We introduce a new simple, mechanical device, a vulvalgesiometer, to standardize genital pain assessment and present promising preliminary data from women with VVS and nonaffected women. These data indicate that women with VVS have significantly lower vestibular pain thresholds compared with control women. During painful vulvar stimulation with the vulvalgesiometer, women with VVS described the pain with adjectives similar to those used to describe their intercourse pain (e.g., burning). This novel device has several important implications for genital pain measurement in women who suffer from urogenital pain.

Treatment of vulvar vestibulitis syndrome with injection of local anesthetic agents.

A. Rapkin, J. McDonald, V. Hayreh

Presented at APS/CPS joint meeting, Vancouver, BC, Canada, May 2004

Vulvar Vestibulitis (VV) is a painful disorder of the vulva with incidence of 15% . Signs and symptoms are a) severe pain with pressure b) vestibular burning/stinging c) inability to have intercourse. Examination reveals erythema and allodynia with cotton touch. Patients have had many treatments with mixed results. Surgical excision of the vulvar has a success rate of less than 50%. A neural-multi-level treatment approach is proposed to elevate the threshold in the periphery. This approach will defeat excessive nerve ending sensitivity and is directed at interruption of pain signals from the periphery with repeated injections of local anesthetics, thus altering central (spinal cord and brain stem) facilitation. The protocol includes: a) treatment of the local skin areas of vestibular tenderness including subcutaneous nerves of the vestibule with local anesthetic, b) treatment of the peripheral nerves innervating the area i.e. superficial and deep branches of the pudendal, and c) treatment of the spinal ganglion of the pudendal nerves. To date we have four women in an ongoing pilot trial that this triple level paradigm has had favorable impact on. This includes a pain threshold measured with the vulvalgesiometer, recording of spontaneous pain, dyspareunia, and suffering. Daily pain assessments are: 1) visual analog scale , 2) Beck's depression inventory, 3) behavioral and attitudinal scale, 3) sexual dysfunction questionnaire, 4) physical therapy score of pelvic floor muscles. Further data is currently being collected on new patients enrolled in the study. This multiple level therapeutic approach demonstrates encouraging results and is neurologically based. Further analysis will hopefully support this therapy as helpful in treatment of this syndrome.

Neural processing of genital pain in women with vulvar vestibulitis syndrome: A functional magnetic resonance imaging study.

Pukall C ,Strigo I , Binik Y ,Khalifé S, Bushnell M

The Journal of Pain, Volume 5, Issue 3, Supplement 1, April 2004, Page S3

Introduction: Vulvar vestibulitis syndrome (VVS) is a common cause of painful intercourse, affecting up to 12% of pre-menopausal women in the general population. Traditionally viewed as a sexual problem, recent evidence points to the importance of the sensory component in women with VVS, specifically, their heightened processing of vulvar tactile and pain sensation.

The objective of the present study was to compare regions of neural activity, via fMRI, in affected and non-affected women during mild and strong vestibular pressure application. Methods: Fourteen women with VVS and 14 matched control participants (mean age 25.7 years) underwent psychophysical testing, consisting of the application of various pressures to the posterior portion of the vulvar vestibule with a vulvalgesiometer while pain intensity and unpleasantness ratings were recorded. Pressure values from this session were used during the fMRI scans. One anatomical and 4-6 functional scans (BOLD protocol, block design) were recorded. Results: The mild stimulation condition was not painful for either group, while the strong stimulation condition was painful for women with VVS but not for non-affected women. For both conditions, women with VVS rated intensity and unpleasantness significantly higher than the control group. These differences were reflected in the associated neural activation patterns; both groups showed neural responses in similar regions, including primary and secondary somatosensory cortices and the insular cortex, during both conditions relative to the no-stimulation baseline; however, women with VVS had higher levels of activity in these regions as compared with control women. Discussion & Conclusions: Combined with previous findings that women with VVS have a heightened perception of genital touch and pain, these results suggest that pain experienced by women with VVS results from augmented processing of genital stimulation and support the re-interpretation of VVS as a pain syndrome rather than a sexual disorder.

An information processing approach to the study of vulvar vestibulitis syndrome.

K. Payne , Y. Binik , R. Amsel and S. Khalifé

The Journal of Pain, Volume 5, Issue 3, Supplement 1, April 2004, Page S3

Aim: The tendency to selectively attend to threatening stimuli (hypervigilance) has been identified as a possible mechanism for altered pain perception. Although hypervigilance has not yet been investigated in women suffering from dyspareunia, both clinical and empirical data support the role of hypervigilance in other chronic pain groups where affective distress seems to play an important mediating role. Specifically, anxiety and fear have been identified as possible mediators of hypervigilance to pain-related stimuli. This model seems particularly suitable for the study of pain perception in women suffering from vulvar vestibulitis syndrome (VVS), where anxiety and fear are hypothesized to play a central role. The present study represents the first empirical investigation of hypervigilance for pain stimuli in women suffering from VVS as compared with normal controls. Methods: Seventeen women with VVS and an equal number of age- and education-matched control participants completed a semi-structured interview, a modified Stroop task, a free recall task, a series of self-report measures, and a gynecological examination. State and trait anxiety, fear of pain, and anxiety sensitivity were also assessed. Results: Women with VVS displayed greater Stroop interference to pain-related stimuli and reported more hypervigilance to pain as compared with controls. State and trait anxiety as well as measures of pain fearfulness mediated this effect. Conclusions: Evidence was found indicating that women with VVS possess anxiety and fear-mediated hypervigilance for pain stimuli, an important maintaining factor for chronic pain. Furthermore, hypervigilance in this population could detract from the processing of sexual cues and further exacerbate the pain via a dysfunction in sexual arousal.

Tender point examination in women with vulvar vestibulitis syndrome: Evidence for generalized and heightened pain sensitivity to manual palpation.

Pukall CF, Baron M, Khalifé S, Binik YM

Presented at APS/CPS joint meeting, Vancouver, BC, Canada, May 2004

Introduction: Vulvar vestibulitis syndrome (VVS) is a common cause of painful intercourse, affecting up to 12% of pre-menopausal women in the general population. In addition to recent evidence pointing to the importance of peripheral processes involved in the development and maintenance of VVS (e.g., increase in innervation), emerging data indicate that the central nervous system may also be involved: women with VVS report more pain-related complaints and have lower non-genital tactile, pain, and pressure thresholds than non-affected women. The primary goal of the present study was to examine whether women with VVS are more sensitive to pressure in non-genital areas of the body than control women. Methods: To date, 6 women with VVS and 12 control participants (mean age 25) underwent a standardized physical examination typically used for the diagnosis of fibromyalgia. An experienced, blinded rheumatologist manually palpated 9 non-genital body locations bilaterally (including left and right gluteal, low cervical, and supraspinatus regions). Pain intensity and unpleasantness ratings were recorded on a scale from 0 to 10. Results: Intensity and unpleasantness ratings were not significantly different for the left and right sides of any given area; therefore, measures from left and right sides were averaged for each site. Analyses of variance (Bonferroni corrected for multiple comparisons) indicated that women with VVS rated both pain intensity and unpleasantness significantly higher than control women at every site examined (all p 's < 0.05). The same pattern of results held when analyses were restricted to 6 VVS-control pairs matched on age and oral contraceptive use. Discussion & Conclusions: Women with VVS reported significantly higher pain intensity and unpleasantness ratings in response to palpation to various non-genital body regions than control participants. These results are consistent with the idea that women with VVS may suffer from a more generalized sensory abnormality than is currently believed.

Pain profiles of women with unexplained chronic vulvar pain: Implications for the classification, assessment, and diagnosis of women with vulvodynia.

K. Fisher, M. Robert, J. Jarrell, L. Carlson, P. Taenzer

Presented at APS/CPS joint meeting, Vancouver, BC, Canada, May 2004

Unexplained chronic vulvar pain is a medical issue that has been neglected by the scientific community. Consequently, consensus on a classification system with validated terminology and diagnostic criteria does not yet exist. Vulvodynia is defined as vulvar burning, rawness, irritation, stinging, soreness, and/or pain occurring in the absence of an underlying, recognizable disease (ISSVD, 1999). This term is used inconsistently and has been applied to vulvar conditions both with known (e.g. vulvar dermatoses) and unknown etiology (vulvar vestibulitis syndrome (VVS), dysesthetic vulvodynia (DV)). To help inform the development of a universal classification system, the investigators of this prospective study systematically characterized the pain and symptom profiles of women with chronic unexplained vulvar pain. Twenty women completed a questionnaire during two visits to the Pain Centre. Women were assessed by one of the two gynecologists during the first visit and then by the alternate gynecologist during the second visit. Questionnaire items and components of the standard examinations were used to assess five dimensions that are commonly used to diagnose VVS and DV, and to determine whether women are easily classified into one of the two groups. Dimensions included: (1) localized vs. diffuse pain, (2) intermittent vs. continuous pain (3) evoked versus spontaneous pain, (4) degree of erythema, and (5) vestibular pain threshold. Moderate test-retest reliability of questionnaire items and moderate correspondence between the gynecologists' examinations were observed for most of the variables. However, the majority of women in this sample did not fit within one of the two diagnostic groups based on the five dimensions that were assessed. This finding

suggests that there is considerable overlap in the characteristics of pain experienced by women with unexplained chronic vulvar pain, and calls into question the validity of the VVS/DV dichotomy.

Vulvodynia.

Lotery HE, McClure N, Galask RP
Lancet. 2004 Mar 27;363(9414):1058-60

CONTEXT: Vulvodynia is a term used to describe chronic burning and/or pain in the vulva without objective physical findings to explain the symptoms. The terminology and classification of vulvodynia continue to evolve, and much remains to be understood about the prevalence, pathogenesis, natural history, and management of this distressing condition. STARTING POINT: James Aikens and colleagues showed that chronic vulval pain (vulvodynia or vulvar dysaesthesia) is associated with worse depressive symptoms (Am J Obstet Gynecol 2003; 189: 462-66). However, the increased scores for depression in this case-control study were attributed to sexual disinterest and experience of chronic pain rather than to features of depressive disorder. These results lend weight to the increasing need for better understanding of the pathogenesis of vulval pain and how to manage it appropriately. WHERE NEXT? The aetiology of vulvodynia and effectiveness of treatments need further study. Appraising the available literature, we have formulated a useful approach to patients with chronic vulval pain. There is a pressing need for further case-control studies of potential causes of vulvodynia and for randomised trials of interventions.

A Multidimensional, Case-control Study of Women with Self-identified Chronic Vulvar Pain.

Masheb RM, Brondolo E, Kerns RD
Pain Med. 2002 Sep;3(3):253-9

Abstract Objective. The purpose of the present study was to conduct a multidimensional evaluation of women with chronic vulvar pain. Design. Fifty-seven women with self-identified vulvar pain were contrasted with 74 healthy control women. Measures were selected based on a multidimensional perspective and included questionnaires related to the core aspects of chronic pain: Pain severity, physical disability, affective distress, and marital satisfaction. Results. In comparison with controls, women with vulvar pain reported significantly greater physical disability and affective distress. In women with vulvar pain, pain severity was not related to physical disability and affective distress. While women with vulvar pain scored in the normal range for marital satisfaction, they reported significantly less marital satisfaction than controls. Conclusions. Findings suggest that the experience of persistent vulvar pain in general, rather than the level of intensity of the pain, accounts for disturbances in functioning and emotional well-being. In comparison with their peers, but not with norms, women with vulvar pain reported less marital satisfaction. A multidimensional approach to the assessment of chronic vulvar pain will lead to a greater understanding of the psychosocial functioning of women with this condition.

A review on vulval pain syndromes.

Folch M, Nunns D
Reviews in Gynaecological Practice, Vol 4, Issue 1, March 2004, Pages 10-9.

The vulval pain syndromes are enigmatic causes of vulval pain. Although not new conditions, only since the mid-1980s have the clinical descriptions of these women have been standardised. In 1991 the term vulvodynia and its subsets were introduced by the International Society for the Study of Vulval Diseases (ISSVD) to describe women with chronic vulval discomfort characterised by burning, stinging, rawness or irritation. The terminology is potentially confusing as vulvodynia was originally described as having subsets including both infective and dermatological diagnoses. These included vulval dermatoses (e.g. lichen sclerosus), vulval vestibulitis, vestibular papillomatosis, dysaesthetic (formerly essential vulvodynia) and cyclical vulvitis. This review article focuses on vulval vestibulitis and dysaesthetic vulvodynia as these relate to vulval pain when infection and organic causes have been excluded and together form the vulval pain syndromes. Recent interest in these pain syndromes probably relates to an increasing number of patients attending vulval clinics, patients' demands and general increased awareness amongst women and health professionals.

Vulvar dysesthesia.

Wall JW

Mo Med. 2004 Jan-Feb;101(1):51-3

Chronic vulvar pain is a significant and misunderstood factor in women's health. Recent new definitions of chronic vulvar dysesthesia have helped to clarify the issue, however the etiology and effective treatment options remain elusive. A systematic approach to the diagnosis and treatment of vulvar dysesthesia is necessary for this difficult and challenging condition.

Chronic pain syndromes of gynecologic origin.

Sand PK

J Reprod Med. 2004 Mar;49(3 Suppl):230-4.

Women seek gynecologic medical attention for 2 main reasons--abnormal bleeding and pelvic pain. Gynecologists are often more comfortable with the diagnosis and management of abnormal bleeding than with the diagnosis and management of pelvic pain. One reason is that chronic pelvic pain can result from a variety of abdominal and pelvic causes, including endometriosis, pelvic inflammatory disease, adhesions and urogenital causes, such as vulvodynia, and from bladder complaints, including overactive bladder, urinary tract infection and interstitial cystitis (IC). The symptoms of IC--chronic pelvic pain with urinary urgency, frequency and nocturia--are all too frequently attributed to these other causes of chronic pelvic pain, in large part because gynecologists rarely consider the bladder as a source of pelvic pain. In addition, IC can masquerade as, and coexist with, other causes of pelvic pain, particularly endometriosis. Early diagnosis and treatment of IC can reduce the occurrence of unnecessary procedures and treatments and can improve the patient's prognosis and quality of life. Bladder-origin pelvic pain should be considered in all women who present with these symptoms.

Sacral neuromodulation decreases narcotic requirements in refractory interstitial cystitis.

Peters KM, Konstandt D

BJU Int. 2004 Apr;93(6):777-9

OBJECTIVE To assess the efficacy of long-term sacral neuromodulation (InterStim(R), Medtronic Inc., Minneapolis, MN) in treating chronic pelvic pain associated with interstitial

cystitis (IC, a symptom complex of urinary urgency, frequency and pelvic pain, often necessitating narcotics) refractory to standard therapy. **PATIENTS AND METHODS** Twenty-one patients (17 female, four male, mean age 45.5 years, range 17-68) with refractory IC with chronic pelvic pain were reviewed retrospectively. In these patients a mean of six previous treatments for IC had failed. All patients had had cystoscopy and hydrodistension to confirm their diagnoses. All had a permanent InterStim device implanted by one surgeon (K.M.P.) between 2000 and 2002, after responding to a temporary test. Data were collected from chart reviews and patient questionnaires. Intramuscular morphine dose equivalents (MDEs) were calculated before and after implantation. **RESULTS** All 21 patients responded to the questionnaire; the mean (range) follow-up after implantation was 15.4 (7.4-23.1) months. Eighteen patients used chronic narcotics before the InterStim and 20 reported moderate or marked improvement in pain afterward. The mean MDE decreased from 81.6 to 52.0 mg/day (36%) after implantation ($P = 0.015$). Four of 18 patients stopped all narcotics after InterStim implantation. **CONCLUSIONS** Sacral neuromodulation decreases narcotic requirements and subjective pelvic pain in patients with refractory IC. Further decreases in MDE are anticipated as dose reductions continue in patients who improved.

[In Process Citation] [Article in French]

Bautrant E, de Bisschop E, Vaini-Elies V, Massonnat J, Aleman I, Buntinx J, de Vlieger J, Di Constanzo M, Habib L, Patroni G, Siboni S, Ceas B, Schiby V, Uglione-Ceas M
J Gynecol Obstet Biol Reprod (Paris). 2003 Dec;32(8 Pt 1):705-12

Clinical signs and symptoms of the pudendal neuralgia are very rich, with a great individual variability. The clinical diagnosis is difficult. It is confirmed or invalidated by the electrophysiological tests. Since October 1998 patient selection has been possible using a diagnosis score. Over a four-year period, the diagnosis of pudendal neuralgia was confirmed by electrophysiological investigations in 212 subjects. We rejected 12 patients because of a radiculo-medullary organic etiology. We only describe here cases of women with a peripheral pudendal nerve injury (200 patients). Thirty-eight neuropathies free of canal symptoms (obstetrical, post-traumatic...) were treated by infiltration therapy. The study of a total of 162 canal syndromes showed prevalent injury at the sacro-spino-tuberal ligamental grip which was observed in 68% of the cases, compared to the Alcock canal which was present in only 20% of the cases. One hundred four of these patients underwent surgical decompression via a transischio-rectal approach after negative results of the infiltration therapy. We report here the surgical methodology, the post-op follow-up and the results, which appear quite successful: after one year 86% of the subjects are symptom-free or with a significant reduction of pain.

Vulvar Dermatoses

Genital Dermatology Atlas

Edwards L

<http://www.lww.com/eproduct/0,0,75755,00.html>

Featuring over 400 full-color photographs of common disease presentations, this text/atlas is a practical guide to the diagnosis and treatment of dermatologic lesions of the genitalia. The book enables clinicians to quickly generate a differential diagnosis and provides specific treatment recommendations for each disease.

Infectious Disease

A growing concern: inability to diagnose vulvovaginal infections correctly.

Ledger WJ, Monif GR

Obstet Gynecol. 2004 Apr;103(4):782-4

The accurate diagnosis of vulvovaginitis should distinguish obstetrician-gynecologists from the vast majority of primary care physicians. Diagnostic accuracy is lost when physicians are unable to do a microscopic examination of vaginal secretions, as well as a "whiff" test and a pH determination. Structured instruction in the use of a microscope should be a required component of obstetrics and gynecology residency training. Physician compensation for this testing should be commensurate with the time and office expense required to provide this service.

Risk factors for recurrent vulvovaginal candidiasis in women receiving maintenance antifungal therapy: results of a prospective cohort study.

Patel DA, Gillespie B, Sobel JD, Leaman D, Nyirjesy P, Weitz MV, Foxman B

Am J Obstet Gynecol. 2004 Mar;190(3):644-53

OBJECTIVE: The purpose of this study was to examine risk factors for symptomatic vulvovaginal candidiasis episodes among women with recurrent vulvovaginal candidiasis (defined as ≥ 4 vulvovaginal candidiasis episodes in 1 year) who were receiving maintenance antifungal therapy. **STUDY DESIGN:** A prospective study of 65 women aged ≥ 18 years with recurrent vulvovaginal candidiasis who attended vaginitis clinics in Detroit, Mich, and Philadelphia, Pa. **RESULTS:** The 9-month risk of vulvovaginal candidiasis recurrence was 41.8%. Almost two fifths of the women reported activity limitations because of vulvovaginal candidiasis episodes, most or all of the time. Younger women and those women with a history of bacterial vaginosis were at increased risk of vulvovaginal candidiasis episodes. Behavioral factors that were associated significantly with increasing vulvovaginal candidiasis recurrence ≥ 2 - fold included wearing pantyliners or pantyhose and consuming cranberry juice or acidophilus-containing products. **CONCLUSION:** The use of pantyliners or pantyhose, consumption of cranberry juice or acidophil-containing products, a history of bacterial vaginosis, and age < 40 years were positively associated with a symptomatic vulvovaginal candidiasis episode.

Vulvar lichen sclerosus : pathophysiology and treatment.

Smith YR, Haefner HK

Am J Clin Dermatol. 2004;5(2):105-25

Lichen sclerosus is a chronic disorder of the skin and mucosal surfaces, and is most commonly seen on the female genital skin. It also occurs on other areas of the body. Any age group may be affected, although it is seen more often in elderly women. The exact cause of lichen sclerosus is unknown. There have been reports of family members with lichen sclerosus; thus it may have a genetic link. There is also the possibility of an autoimmune connection. Currently, ultra-potent topical corticosteroids are the medical treatment of choice. Other treatments that

have been utilized for this condition include testosterone, progesterone, tacrolimus, surgery, and phototherapy. Surgery should be reserved for symptomatic patients who fail to respond to multiple medical treatments, as there is a high recurrence rate following surgery. The risk of developing squamous cell carcinoma of the vulva approaches 5% in women with vulvar lichen sclerosis, and therefore close surveillance by the healthcare provider and patient is needed. This review discusses the history, clinical features, pathophysiology, and treatment of lichen sclerosis of the vulva, as well as pregnancy issues and sexual function in patients with this condition. In addition, problems specific to children with lichen sclerosis are reviewed.

Basic Science

Early structural effects of oestrogen on pudendal nerve regeneration in the rat.

Kane DD, Kerns JM, Lin DL, Damaser MS.

BJU Int. 2004 Apr;93(6):870-8

OBJECTIVE To determine the early effects of oestrogen on the ultrastructure of the pudendal nerve and distal nerve fascicles near the external urethra sphincter (EUS) after a pudendal nerve crush injury. The pudendal nerve is one of the pelvic floor tissues injured during vaginal delivery, possibly contributing to the development of stress urinary incontinence (SUI) in women, the symptoms of which often do not appear until menopause, implicating hormonal factors. **MATERIALS AND METHODS** Twenty-seven virgin female Sprague-Dawley rats were anaesthetized and underwent ovariectomy. Three days later, they had one of four procedures: bilateral pudendal nerve crush plus implant of a subcutaneous oestrogen-containing capsule (NC+E); nerve crush plus implant of a sham saline-containing capsule (NC+S); no nerve crush with an oestrogen capsule; or no nerve crush with a sham capsule. After 2 weeks the pudendal nerves and urethral tissues were prepared for light and electron microscopy. The number of axons, myelin figures and endoneurial nuclei in the pudendal nerve segment distal to the lesion were counted. Nerve fascicles near the EUS were also counted and categorized as normal or showing signs of degeneration and/or regeneration. The location of each nerve fascicle was specified as either ventral or dorsal. **RESULTS** As there were no significant differences between the two control groups they were combined to form a single control group. In the distal pudendal nerve there were significantly fewer myelinated axons and large myelinated axons in the NC+E and NC+S groups than in the control group. There were three times as many large unmyelinated axons in the NC+E group than in either the NC+S or control groups ($P < 0.05$). There were only half as many nerve fascicles near the ventral side of the EUS in the NC+S group than in both the control and NC+E groups ($P < 0.05$). **CONCLUSION** Oestrogen appears to affect large unmyelinated axons in both the injured pudendal nerve and at the denervated EUS target. After pudendal nerve crush, nerve fascicles with evidence of degeneration or regeneration near the EUS appear to be spared with oestrogen treatment, particularly in the ventral region. These observations may reflect the early stages of a neuroregenerative effect of oestrogen. Additional studies are needed to confirm these results at later periods and with functional methods.