Complementary care; acupuncture and manual therapy; treatment and diagnosis in production animal medicine and surgery (reproduction emphasis)

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Introduction

Complementary care, specifically acupuncture and manual therapy (chiropractic, osteopathy, physical therapy, myofascial work) are becoming important therapeutic modalities in production animal medicine, especially in the area of pain and reproduction. These modalities are already being used extensively in treating many situations in equine, avian, and small animal medicine and surgery. The acupuncture and manual therapy examination is being used for diagnostic purposes and for therapy. The examination utilizes soft palpation and joint manipulation in attempts to isolate pain and/or lack of normal function that may lead to loss of performance or reproductive status. Acupuncture and/or manual therapy techniques are then applied to the animal in an attempt to regain normal function and reproductive success.

Keywords: Acupuncture, complementary therapy, manual therapy, infertility

Acupuncture and manual therapy are best utilized as complementary care modalities used in conjunction with conventional therapies. Their popularity and use is increasing as a secondary additive-type of therapy especially in those complicated medical/surgical or economically challenging situations. With the rising concerns of drug withdrawal, drug usage, injection site lesions in food animal medicine, and the use of hormonal implants, as well as the known successes, the acceptance of alternative therapies in the eyes of the public as well the rancher and equestrian is increasing.

Some of the areas in which complimentary modalities are being utilized in veterinary medicine include, but are not limited to:

Diagnostic acupuncture

Acupuncture and manual therapy techniques can be utilized in large and small animal medicine for therapeutic and diagnostic purposes. Specific acupuncture points can become sensitive (Ah-Shi points) or painful with certain pathological conditions. Applying pressure to these points and eliciting a painful or sensitive response may help to pinpoint areas of concern or pathology. This is best described and explained by overlapping dermatomes, sclerotomes and myofascial trigger points. Shu points or transport points are located along the "bladder channel" and often help to diagnose visceral pathology, via the visceral somatic neurological pathway. They can also be used to treat abdominal and thoracic disease as well as reproductive failure. Some of the most commonly used examples of diagnostic acupuncture include:

- Cardiac disease (high mountain disease, pericarditis, endocarditis, myocardial dysfunction):
  - Sensitive points include: BL-14, 15, ST-10, 11, PC-1, CV-14, and CV-17.
- Lung disease (pneumonia, pulmonary hypertension, any type of lung pathology that may lead to pulmonary pain):
  - Sensitive points include: BL-13, 14, 15, 16, 17, 41, and 42, LU-1
- Gastrointestinal ruminant:
  - Rumen: BL-43-01, ST-36, SP-16 (left side), ST-36
  - Abomasum: BL-18, 19 (right side)
  - Small and large intestinal tract: BL-21, 22, 23, 25, 26, 27, and 28, ST-36
- Gastrointestinal other species:
  - BL-18-26, ST-36
- Liver:
  - BL-18, 19, 20, 43, 44, 45; often these points will be sensitive bilaterally but seem to be most sensitive on right side.
- Ovary:
  - BL-22, 23, GB-26; Often the more intense response (pain) will be on the side of the affected ovary, i.e. cyst, retained corpus luteum; this is most obvious in the mare.
• Uterus:
  o BL-26, 27, 28, GB-27, SP-18, BL-30; diseases of the uterus that can make these points sensitive are pathologies including, endometritis, pyometra, uterine trauma, and uterine torsion.

• Udder:
  o SP-18 (front quarters) located just dorsal to the milk vein. BL-30, (hind quarters) located bilaterally to the sacrum in a bone indentation, lateral and ventral to the last sacral foramen, unreliable.

Reproduction

Acupuncture and manual therapy are being used in conjunction with conventional therapies for those refractive non-breeders including cystic ovaries, early fetal loss, dystocia, retained placenta, anestrous, estrus synchronization, loss of libido, failure to ejaculate, poor semen quality, and failure of semen to freeze and thaw. Acupuncture and manual therapy techniques and methods are numerous and there is a wide range of variability to each. Some of the techniques include: dry needling, dry needles stimulated with moxa (Artemisia vulgaris) which is lit and used to heat the area around the needle or the needle itself, electrical stimulation and physical movement of the needle, aquapuncture, laser therapy, motion palpation, chiropractic manipulations and physical therapy.

Treating loss of libido as well as a decline in semen production has proven to be quite successful by utilizing needles, moxa, electrical acupuncture, and aquapuncture. When considering the use of acupuncture or manual therapy in reproductive disorders it is important to focus on the innervation of the organs involved as well as hormonal influences. Often reproductive failure is secondary to an undiagnosed lesion that has nothing to do with the urogenital tract. Painful pathology can result in reproductive failure secondary to loss of normal neurological function to one or more reproductive organs. A good example of this is the stallion that cannot maintain an erection or will no longer mount to breed. When cases with this history are examined via western medicine or complementary, they are often found to have lumbo-sacral pain and dysfunction. Once a lesion is isolated and treated with conventional or complementary therapies reproductive status often returns to normal. There are numerous reported cases that involve males that have the history of reproductive decline as well as a decreased libido that when treated for lumbo-sacral pain and dysfunction returned to normal reproductive behavior and success. Extending the pathology from the lumbo-sacral region, a male or female animal with severe back pain (active NMDA receptors, wind-up) will often have complete reproductive failure. To regain reproductive function the etiology behind the wind-up and pain must first be treated and the pathology eliminated. Trying to breed a mare in wind-up or utilize a male for breeding or collection that is experiencing the same can be unsuccessful for years without proper treatment.

Acupuncture and manual therapy for reproductive issues is a neuroanatomic approach. Specific spinal and sacral segments must be evaluated and treated according to the spinal nerves that exist at that location and the organ they innervate. For instance the lesser splanchnic nerve exits the sympathetic trunk near L-1, 2; pathology in this region may affect kidney and/or adrenal function thereby altering neuro-hormonal reproductive status. These spinal segments must be evaluated and treated if pathology exists. If there are lesions in specific areas coursing along spinal segments and the nerves leaving that segment are affected then normal function of the specific organ innervated by that nerve will be impaired leading to loss of normal function and possible reproductive failure. Often the case may involve numerous areas of pathology; all must be treated prior to the return of normal reproductive status. It is rare that one area of pathology will result in reproductive loss.

Evaluation of hormonal control must be considered as well. The pituitary gland and hypothalamus are under constant control and stimulation from organ function, be it positive or negative feedback. Balanced pituitary and hypothalamic function is essential for the treatment of reproductive disorders. Even though these organs cannot be specifically acupunctured, there are techniques that can be used to help induce neuro-hormonal feedback. Specifically parasympathetic or sympathetic influence can be initiated by acupuncturing points around the pituitary/hypothalamic vascular supply near occiput C-1 level. Acupuncture at these sites may indeed influence the pituitary/hypothalamic function by increasing parasympathetic input to the gland and influencing production of thyroid-stimulating hormone (TSH), follicle-stimulating hormone (FSH), and luteinizing hormone (LH) through the adenohypophysis and gonadotropin-releasing hormone (GnRH) through the hypothalamus. The posterior pituitary may also be influenced through regional point selection and help regulate the production of oxytocin and vasopressin (ADH). Points commonly used for pituitary/hypothalamus stimulation are BL10, GB20, TH17, and YinTang. Other points cited include GV1, GV4, CV1-5, these are points located over reproductive organs. Those points stimulating adrenal innervation include BL23, 25, 31-35.

Regardless of the reproductive issue, the approach to all veterinary patients should be the same. The patient should always have a complete in-depth western medical examination and evaluation. After a medical
diagnosis has been made and addressed or routine therapies have failed the animal can then be evaluated for the use of alternative or complementary therapies. The patient should be evaluated first by the diagnostic acupuncture examination (DAPE) or manual therapy examination evaluating the entire body, including gait analysis, motion of individual joints, the sympathetic and parasympathetic nervous system and reproductive organ health. As previously discussed, many reproductive failures may be due to loss of normal neurological input to a specific organ. This situation can be secondary to a specific lesion on the vertebral column or chronic pain secondary to a musculoskeletal disorder. It is for this reason that each animal must be evaluated completely regardless of the primarily reproductive concern.

Examples of this include erectile function and ejaculation. Erectile function is primarily regulated by the parasympathetics with the striated muscle aspect under the control of somatic innervation. Emission of the ejaculate is under the primary control of the sympathetic nervous system. Therefore when evaluating such disorders in the male, acupuncture should be directed at the innervation of the penis as well as that portion of the nervous system with autonomic, sympathetic or parasympathetic control. If dealing with failure to ejaculate it would be appropriate to first evaluate the entire back of the animal regardless of species looking closely at the lumbo-sacral region as well as the sacrum. This region must be evaluated for motion, pain and normal function. Any restriction in this area can result in malfunction or decreased function of the pudendal nerve. The pudendal nerve exits in the dog from all three sacral nerves (S1, 2, 3). In other species specifically other large animal species, not ruling out slight differences, the pudendal nerve exits primarily at S2, 3, 4. Function of the pudendal nerve is essential in reproductive performance in the male and the female.

The pelvis and sacral region of all veterinary patients must be evaluated for function and then stimulated via manual therapy and or acupuncture. The pudendal nerve gives rise to the caudal rectal nerve that innervates the external anal sphincter and levator ani muscles all to be evaluated for such conditions as urine pooling in the female. The perineal nerve also arises from the pudendal and innervates area such as the muscles of the penis and perineal region as well as the vestibule and vulva. Also arising from the pudendal is the dorsal nerve of the penis. The dorsal nerve of the penis courses through the ischial arch to the dorsal aspect of the penis or clitoris and continues to the glans penis and ends at the apex of the glans or clitoris. Arising from the sacral plexus is the caudal gluteal nerve which courses with the pudendal allowing for nerve cross talk in its intra-pelvic pathway as it supplies the perineal branches to the skin around the anus again a concern with urine pooling or prolapse of the rectum and or the vagina. These nerves also can have effect on the penis in such conditions as phimosis or paraphimosis. It can be seen by this example that evaluation of the sacrum and stimulation of the sacral region, one can achieve parasympathetic stimulation from the pelvic splanchnic or sacral nerves from S2, 3 thus stimulating or regulating reproductive function.

Mares often present for the primary concern of loss of performance or speed, or the inability to pick up or hold a lead. When further evaluating the primary complaint, loss of performance, the history of reproductive failure may arise. By evaluating the primary complaint by means of a thorough evaluation the basis behind the reproductive failure may become evident. There are many situations in which there may not be a specific western diagnosis that is leading to the drop in performance and reproductive use. In these situations approaching the case via complimentary or alternative methods using the techniques discussed can often be successful. The nervous system is reliant on exact input from mechanoreceptors (MR) and muscle spindle cells (MSC) for accurate integration into the system to allow for movement and normal reproductive function. It is important to evaluate the peripheral limbs as well as spinal segments in an evaluation. When central nervous system (CNS) input is altered, via pathology affecting MR or MSC such as, restricted motion or pain, the CNS cannot respond normally to the altered input giving rise to an altered response. The altered response may be severe resulting in an altered gait, musculoskeletal function, or loss of reproductive performance. By diagnosing this altered input in the techniques discussed and treating it via western medical approaches as well as complimentary therapeutics it is possible to regain accurate receptor stimulation and neurological afferentation leading to a reproductively and mechanically sound animal.

Completing a thorough examination not only involves the peripheral limbs, sacro-pelvic and lumbar regions of the body but also the thoracic spinal segments. Insuring normal motion and function of the thoracic spinal segments insures normal function of the greater splanchnic nerves arising from the sympathetic trunk at T-6-13 and the lesser splanchnic nerve from L-1-2 which innervate reproductive organs as well as the adrenals. Looking at the equine as a case example, realizing other species can be evaluated in the same protocol with anatomical differences we can approach the nervous system and possible dysafferentation resulting in reproductive failure.
Lumbar vertebrae

As a quick anatomical review of the lumbar vertebral segments, there are in most horses six lumbar vertebrae. The angle of joint facet is vertical and there are six articulations on the cranial lumbar vertebrae and ten on the caudal. Joints that are often overlooked that may have local as well as systemic pain issues are the intertransverse joints, giving rise to the ten articulating joints in the caudal lumbar vertebrae. The intertransverse joints are most commonly located bilaterally and lateral, to L-4, 5, and 6. They are responsible for adding power in the push off as well as stability of the hind quarters. The lumbar region is one of the most concentrated regions of the body for pain and loss of motion. Many of the complaints that the clients may express are: sudden bucking, painful under saddle, loss of push off, loss of ability to turn tightly, hock pain, failure to drop in the rear, overall body pain, lack of performance, lack of desire, and reproductive abnormalities including urine pooling and retention of uterine fluid. This is an area in which the DAPE can be very helpful yet very confusing at the same time. There is often local pain over the lumbars especially over BL-23, between the second and third lumbar vertebrae the area of the exiting of the lesser splanchnic nerve. Other pathologies related to this area (L-1,2,3) through the DAPE are, stifle pain, hock pathology, endocrine disorders, overall back and sacral pain, contralateral forelimb pain, spinal pain, bladder pain, urinary disease, psoas muscle pain, reproductive abnormalities, and local bruising or overall sore back from overuse.

The DAPE serves only as a guide to pain and myofascial dysfunction; most pathology in this area is isolated via motion palpation. Motion and soft tissue palpation in the lumbar spine is critical in evaluation of restricted motion. Often ultrasound is required to better visualize the extent and severity of the pathology present. Motion palpation is best done by evaluating lateral motion bilaterally of the lumbar vertebrae. Grabbing the base of the tail with one hand and placing the other against the facet of each vertebral body, lateral motion can be evaluated thereby detecting loss or restricted motion or pain associated with motion. Lumbar restricted motion can often be improved by motion palpation only. Other pathologies that these lumbar vertebral restrictions may be related to are: L-1, reproduction failure especially ovarian disease or retained testicle; L-2-3, kidney related problems, patella, stifle and sacroiliac pain. Any type of loss or restricted motion in the lumbar vertebrae can result in lower back, sacral, intertransverse joint and L-S pain. The intertransverse joints are often affected by DJD and can be a source of chronic non-responsive pain. These joints can both be evaluated and treated by ventral and cranial motion just lateral to L-4, 5, 6. Pain or resistance with this pressure can be an indication of intertransverse joint pain and loss of function.

Sacroiliac (SI) joint

The SI joint is unique in that it has both a hyaline cartilage aspect on the sacral articulation and a fibrocartilaginous aspect on the ileum. The joint sits at a 65 degree angle in the horse and is supported by many ligaments and supportive tissue. The SI joint is gaining recognition as a joint that can be the source of much inflammation and pain as well as lack of motion resulting in extreme loss of performance. The primary etiology of disease in this area is often related to strain or sprain of the surrounding supportive tissue giving rise to loss of motion unilaterally or bilaterally. It is often recognized by failure of the tuber sacrale (TS) or tuber coxae (TC) to drop or rise. The SI joint can have a dorsal or ventral fixation/restriction (loss of motion) as well which can be unilateral or bilateral. These restrictions can be diagnosed often by watching the horse move or by applying pressure to the tuber coxae and trying to motion the joint in line of articulation. Motion palpation bilaterally is often the best means to regain movement in this joint. It is common that severe SI issues may have to be addressed with western medical approach i.e. injecting the joint, to help relieve inflammation present and then continuing with complementary care to maintain good joint health. Chronic or acute SI pain can cause severe motion restriction and inflammation affecting the sacral nerves which can result in dysafferentation of the sacral nerves and parasympathetic’s severely affecting reproductive status.

Sacrum and pelvis

This area is by far one of the most complex and difficult regions of the horse to diagnose and treat. There are many issues and combination of issues that can be taking place. Often pelvic and sacral issues are secondary to overwork, or pain elsewhere in the body. Diagnosis of inflammation and pain over the pelvis and sacrum are best done by motion palpation and the DAPE as well as a routine western medical lameness evaluation and ultrasound. There are three basic categories to pelvic abnormalities or lack of motion. Category I is torsion of the pelvis without osseous misalignment of the SI articulations. This is a twisting and tension pull through the SI joint. Often this is secondary to other areas of pain including shoulder and girth. On the DAPE if there is tenderness and a positive area over the shoulder region at LI-16, GB-21, ST-10, or SI-9, consider a twisted pelvis that may involve not only pelvis but sacrum as well. This can be evaluated by checking DAPE over the pelvic region and by doing motion...
palpation and checking for a loss of motion in pelvic rotation. Category II is the basic SI joint loss of motion. This type of pathology most commonly results in loss of balanced gait, painful gait, and lower back pain. Category III has no SI involvement but involves a rotation of the sacral pelvic complex (L-S junction) with L-6. This rotation often results in extreme burning pain in the lower back and the lumbosacral (L-S) joints. Category III pelvic condition should be high on the differentials in those horses that drop in the pelvic region with the DAPE or show extreme tenderness in the LS region. The sacrum is often involved secondary to pelvic categories as described above. A sacral problem is most often seen by the client as a horse that tends to carry its tail to one side consistently.

Clinical applications

Complimentary care is becoming an extension of a western medical approach to the veterinary patient. Complimentary care should not be limited to just one modality but used to provide a complete diagnostic workup and a complete therapeutic approach involving evaluating the patient as a whole body and not as a specific organ failure. Therapy to treat any reproductive loss or problem should be a combination of manual therapy, western medical approaches and the use of acupuncture as well as many other modalities. Below are a few reproductive disorders that were treated in this fashion, utilizing a neuroanatomical approach to acupuncture.

**Uterine/vaginal prolapse (primarily large animal).** Place needles prior to attempting to reduce the prolapse and run electrical acupuncture at a low frequency setting (GV-2, GV-3). This protocol seems to help with a release of oxytocin as well as endorphins. Other points to utilize BL-23, 25, 28, 29, 30, GV20. Electrical acupuncture from BL-23 to BL-30

**Anestrus, lack of ovulation (can be used to help potentate ovulation after AI).** Moxa BL-22, 23, 24, 26, laser or needle if possible SP-6 and SP-9, ST-36 and KI-1. After moxa of BL-22 and 23 needle and/or inject vitamin B-12 or saline into the AP points. It should be noted that the author is not utilizing aquapuncture in food animal species, following guidelines set forth by the quality beef assurance program. Dry needle techniques, electrical stimulation, and moxa are the most common modalities used.

**Cystic ovaries.** Always treat with conventional therapies if possible and add acupuncture and manual therapy techniques as described above as a complementary treatment. If conventional therapies cannot be used then increase the frequency of the acupuncture. BL-23, 24, 25, 26 bilaterally with ST-36, TH-22, and GV-1.

**Retained corpus luteum and pyometra.** Identify side with the retained corpus luteum and needle BL-22, 23, 24, ST-36, with GV-1. If no response or if used without other therapies then use electrical stimulation.

**Mastitis.** Mastitis is a disease in which many practitioners report they have never seen a noticeable difference if acupuncture was utilized therefore it is not suggested that acupuncture be used as the treatment of choice for mastitis. For completion of the notes or to stimulate others to better research this field it is being included here. It is best to needle and treat the same side of the cow as the side of the mastitic quarter. If possible, when antimicrobial therapy is used according to regulation and administration directions, inject the desired acupuncture points with the antimicrobial selected. For example, if ceftiofur (not recommended for the use for mastitis) is used as a systemic antimicrobial therapeutic modality, then use it intramuscularly in the acupuncture points BL-30 and BL-54. Then needle the following: front quarter SP-17, 18, 21, and ST-12; rear quarter BL-30, SP-12, BL-49, KI-10 and CV 2, 3.

**Bull infertility.** This includes loss of libido, loss of ability to mount, and poor semen quality. BL-22, 23, 31, GV-3-01, GV-4, CV-2, 6, GV-1, CV-1 with moxa at BL-18-28, always following a complete musculoskeletal examination.

**Example case.**

Signalment: Four year old Horned Hereford bull.

History: At the age of 24 months began to show an increase in the number of primary spermatozoa defects, primarily tight curled tails. By the age of 26 months was settling very few cows and semen not suitable for freezing. Bull was also noted to have a drop in libido. Was placed on long term antibiotics and received multiple breeding soundness examinations showing no improvement. For the last two years sired very few calves. Owner elected as last resort to try a round of acupuncture, had heard about it through semen collection units across the USA.
Examination: Temperature, pulse and respiration all within normal limits, body condition score 6 of 9, no gross abnormal physical examination findings.

DAPE examination: Loss of lateral motion from L1-6 associated with pain and segmental dysfunction, loss of ventral motion bilateral SI joints and associated with pain and discomfort.

Treatment: All western medical approaches had been tried; bull was referred by other veterinarians for possible complimentary therapy.

- Complimentary care initiated, acupuncture and manual therapy:
- Manual therapy done involving motion palpation and manipulation followed by high velocity low amplitude SI adjustments and the use of vibration massage.
- Acupuncture performed
  - Points used in this case:
    - GV-24—Calms and quiets parasympathetic input, has some thought of influencing the pituitary for balancing affects.
    - Da Feng Meng—Centers, parasympathetic stimulation
    - BL-18-26, Somato-visceral arch, stimulation of kidney, spleen, adrenals, reproductive organs
    - GV-1—stimulation of perineal nerve as well as pudendal influencing organs of reproduction.
    - CV-1— stimulation of perineal nerve as well as pudendal influencing organs of reproduction. Has specific influence on the dorsal nerve of the penis as it courses along the ischial arch.
    - GV-4—(Ming Men)—Major point for stimulation of kidney and adrenal innervation.

Summary

In summary, it is obvious to see that complimentary care and therapy is gaining acceptance and strength in the veterinary profession. There is a great need for scientific studies to support the neurology behind complimentary care and to support therapies concerning different pathological processes. Complimentary care is a very complex interaction of the nervous system and involves more than just placing needles into an animal with hopes of generating a response. Each animal must be looked at as an individual and examined accordingly. Cookbook protocols can be utilized but still require an in-depth physical examination and treatment of all issues present. Often the animal’s primary complaint has multiple etiologies. For the best success all issues must be addressed both with western medical modalities as well as manual therapy and acupuncture techniques. It is very important to address the issues with direction of neuromodulation and stimulation of the central nervous system.

Suggested reading