dissociation and the body

dissociation v8.pages
02/05/2013
Steve Haines DC BCST
www.stevehaines.net
comments welcome to: steve.haines@mac.com

Introduction

The purpose of this paper is to discuss the relationship between dissociation and bodywork. **Some degree of dissociation is very common in people with musculoskeletal complaints**: a significant proportion of my work with clients involves negotiation around dissociative states. There is a continuum of responses from feeling slightly numb in one part of the body when focusing on body sensations to feeling completely detached and outside of the body as a basic state. The paper discusses research from psychiatry, body psychotherapy approaches, the physiology of pain, polyvagal theory and the neurology of connective tissue. One of the aims is to explore how trauma affects the somatic nervous system as well as the autonomic nervous system. Unresolved trauma has many consequences, including effects on our musculoskeletal health.

What is dissociation?

> "I heard a shout; starting and looking half around I saw the lion just in the act of springing upon me ... Growling horribly close to my ear he shook me as a terrier does a rat. The shock produced a stupor similar to that which seems to be felt by a mouse after the first shake of the cat. **It caused a sort of dreaminess in which there was no sense of panic or feeling of terror**, though I was quite conscious of all that was happening ... This peculiar state is probably produced in all animals killed by the carnivora; and if so is a merciful provision by our benevolent creator for lessening the pain of death"
>
> *The explorer David Livingstone giving a classic description of dissociation. Kandel et al (2000:489)*

Dissociation is a well-established phenomenon (DSM IV, van der Kolk 1996, Levine 1997, Nijenhuis 2000, Rothschild 2000, Shapiro 2001) occurring in people who have experienced some form of trauma. According to the Diagnostic and Statistical Manual for Mental Disorders, Fourth Edition (DSM-IV; American Psychiatric Association, 1994), the essential feature of dissociation is a disruption of the normal integrative functions of consciousness, memory, identity, and perception of the environment. Nijenhuis (2000:22) adds, 'Dissociation also pertains to the body.'

Much of the research on dissociation emerged from the identification of post-traumatic stress disorder (PTSD) as a distinct condition. Van der Kolk (1996) identifies core symptoms of PTSD as intrusions (thoughts, dreams, flashbacks), hyperarousal and numbing. This paper concentrates on the numbing or

dissociative element. It is primarily a parasympathetic response that involves the limbic system and brainstem and is experienced through the body. It is important to remember, however, that dissociation is a last-ditch strategy and is seen alongside other responses of attempting to communicate or mobilise (see Hierarchy of Responses below). Levine (1997) compares living with overwhelm in the ANS to driving a car with one foot full on the accelerator (hyperarousal – sympathetic overwhelm) and the other foot full on the brake (numbing – parasympathetic overwhelm) or rapid switching between the two states. Van der Kolk (1996) suggests that with time some people's PTSD may become subclinical and yet continue to influence their level of functioning.

Hierarchy of responses

We have very primitive responses in the presence of any threat to our integrity. Porges's (2003) polyvagal theory lists a hierarchy of responses, each involving progressively older evolutionary responses of the ANS: communication, mobilisation and freezing.

One of the most basic questions human animals operate around is **'Am I Safe?'**. If the answer is no, our physiology prioritises its resources to fight/flight or freeze. It is essential to help clear these underlying mechanisms to facilitate the healing process.

Communication

Initially, with any perceived threat there is an orienting response, an engagement with our environment to gain more information. In this stage a mouse may sense a hint of cat and sharpen its hearing and smell, open and move its eyes and turn its head to gain more information. There is a temporary stilling of the heart, breathing and posture. In humans this orienting response is highly developed and frequently includes communication. This is based on our previous experiences of attachment to figures of safety. This response comes from a newer part of the parasympathetic nervous system. Porges calls it the social engagement system. It is mediated by cranial nerves V, VII, IX, X and XI. Neck issues may be rooted in dysfunction in the orienting response.

Mobilisation

The next response is the fight or flight mechanism. The mouse sees the cat and, in this case, the mouse runs as fighting is not an option. Humans can get confused at this stage as we have been both predator and prey in our history. The sympathetic nervous system goes into overdrive, the hypothalamus-pituitary-adrenal (HPA) axis releases large amounts of cortisol. We breathe more quickly to get more oxygen, the heart beats faster and more strongly to pump as much oxygen-rich blood as possible to the large muscles, the pupils dilate to take in more light, the blood supply to the periphery (hands, feet and skin) is reduced and the digestive functions are reduced.

Freezing

The final response is the dissociative or freeze response. If the mouse is caught it goes limp and plays dead. Its body is flooded with endorphins, the body's natural painkillers. If it is going to die the release of endorphins mean it will feel no pain. There is another evolutionary advantage: the predator may be put off, as it may have instincts against eating carrion. The cat may lose interest in playing with the mouse and the mouse can then move to safety. This response is mediated by an old part of the parasympathetic nervous system, slowing down the heart and breathing (see section on the physiology of dissociation). Reptiles are good at feigning death as they can maintain long periods with reduced blood circulation.

Porges's description of the orienting response via the social engagement system is a relatively new understanding and will not be explored further here. The fight or flight is much more commonly known. It is the phase where we get anxious or aggressive and is frequently misunderstood to be the whole of the response to stress. The freeze response is a significant but often-overlooked factor. The insight of Van der Kolk (1996), Levine (1997), Rothschild (2000) and others working with trauma is that dissociation has huge implications for the body; it is not just a psychological, hysterical, hypochondriac construct. For bodyworkers this means appreciating that there will be real musculoskeletal effects.

Related literature

Multiple Idiopathic Physical Symptoms (MIPS)

Engel (2004) coins a new term for the collections of physical symptoms seen with somatisation of trauma: MIPS. Engel says that 'MIPS may also represent the physical manifestations of an anxiety or depressive disorder, including PTSD'; 'MIPS are common in the general population and in primary care settings.'

According to Engel (2004) common conditions involving MIPS are:

- Low back pain
- Patellar femoral syndrome
- Chronic pelvic pain
- Chronic headache
- Chronic pain syndromes
- TMJ disorders
- Fibromyalgia
- Myofascial syndromes

Somatoform dissociation

'Somatoform dissociation' is a term used by Nijenhuis (2000:9) to include disorders of 'movement and sensation'. The actual classifications (between PTSD, Dissociative Identity Disorder, Somatoform Dissociation, Acute Stress Reactions, MIPS etc) get confusing. What is important to recognise is that **there are clear somatic consequences to dissociation, which can be present subclinically**. Nijenhuis (2000:10) states,

> 'Many cases of dissociative disorder predominantly remain in a condition that has been described as an 'apparently normal' personality ... However on closer scrutiny he or she is characterised by a range of negative symptoms.' The negative symptoms are listed as 'partial or complete loss of knowledge (amnesia), loss of sensations such as loss of tactile sensation, kinaesthesia, smell, taste, hearing, vision, and pain sensitivity (analgesia), and loss of motor control (inability to move or to speak)'.
>
> Nijenhuis (2000:10)

Memory

Levine (1997) and Rothschild (2000) stress that knowledge of the relevant physiology is essential to understanding the symptoms of trauma. It is a preconscious experience, involving primitive parts of the brain – the brainstem and limbic system (especially the amygdala and hippocampus) and the ANS. In PTSD there can be free-floating, highly-charged emotional responses where the initial context is hidden. It appears that there is a loss of communication between the amygdala, which provides the emotional charge and implicit memory, and the hippocampus, which provides the context and explicit memory. In PTSD the hippocampus does not inhibit the amygdala. The strong emotional charge associated with the amygdala may initiate fight/flight or freeze. Excess cortisol is implicated in inhibiting the explicit memory of the hippocampus.

The storage of implicit memories often involves emotional states, the right brain, the amygdala and the body. This encoding of memory in the internal environment and structure of the body is very relevant to bodyworkers. A particular posture, muscle tension, smell or sound, in fact *any* somatic trigger may lead to the activation of a memory and emotional response - 'state-dependent recall'. Rothschild states,

> 'Though usually discussed in reference to internal states, state-dependent recall is exceedingly relevant to postural states.' 'The somatic nervous system carries out the trauma defensive reactions of fight, flight and freeze through simple and complex combinations of muscle contractions that result in specific positions, movements and behaviour. In co-operation with proprioception, the somatic nervous system is also party to encoding traumatic experiences in the brain.' Rothschild (2000:55-56)

Physiology of dissociation

Analgesic system

Pain has been extensively studied. Bove and Swenson (2003) discuss a descending modulation of pain and endogenous opiates (endorphins and encephalins). They state that receptors for opiates have been localised in several brain regions (notably the periaqueductal grey [PAG], dorsal horn of the spinal cord, ventral medullary raphe nuclei, and basal ganglia).

> 'Activation of the analgesia system by nervous signals entering the PAG and periventricular areas can totally or almost totally suppress many pain signals entering through the peripheral nerves.' (
>
> Guyton and Hall 2000:556)

Guyton and Hall (2000:555-556) describe the analgesia system as having three major components:

- 'the periaqueductal grey (PAG) and periventricular areas of the mesencephalon and upper pons surrounding the cerebral aqueduct and portions of the third and fourth ventricles. Neurones from these areas send their signals to:
- the raphe magnus nucleus in the lower pons and medulla and the nucleus reticularis in the medulla. From these nuclei the signals are then transmitted down the dorsolateral columns in the spinal cord to
- a pain inhibitory complex located in the dorsal horns of the spinal cord.'

'Several transmitter substances are involved in the analgesia system; especially involved are the encephalins and serotonin.' (Guyton and Hall 2000) They are secreted by the structures named above.

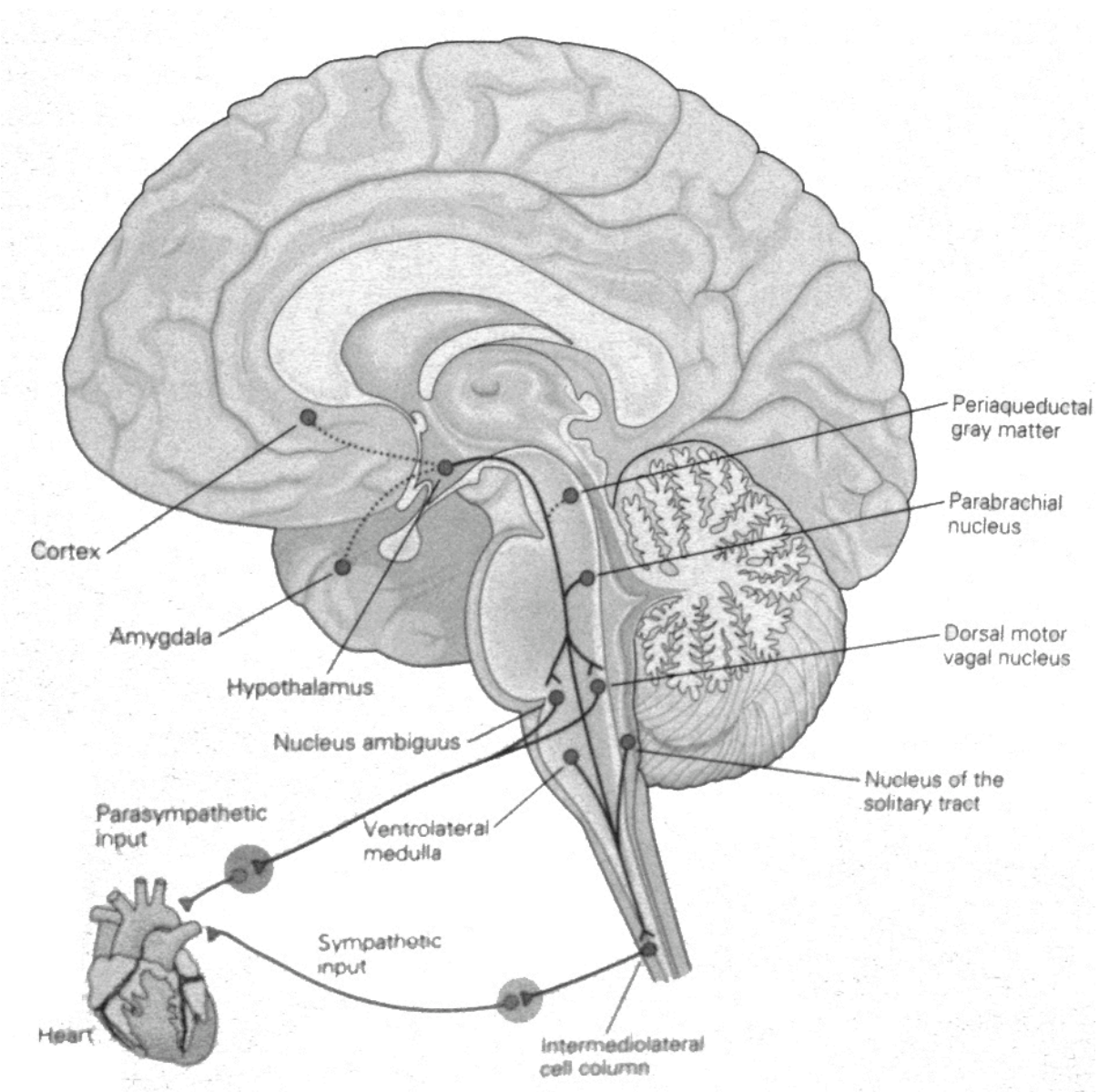

Fig1.1 *Pathways that control autonomic responses*

Guyton and Hall (2000) go on to state that higher levels of the brain, especially the hypothalamus, can in turn excite the PAG.

Lumb (2001) indicates that the PAG is not a homogeneous structure, but is organised in the form of longitudinal columns that run parallel to the cerebral aqueduct, have discrete connections to different areas of the hypothalamus and receive signals from different afferent fibres. According to Lumb inescapable nociceptive inputs, whether they arise from internal and deep tissues or result from persistent noxious stimulation of cutaneous structures (they tested this by clipping a bulldog clip to the back of a rat), activate neurones in the venterolateral PAG (VL PAG) columns. Activation of the VL PAG evokes passive emotional coping that includes quiescence, vasodepression and sympatho-inhibition.

In contrast, escapable nociceptive inputs, such as slight injury to the skin, are more likely to activate neurones in the lateral PAG columns. Activation of the lateral columns triggers a mobilisation response 'active emotional coping: the fight or flight response.' (Lumb).

Though Lumb does not use the term here, passive emotional coping would seem to be equivalent to the state of dissociation. **This research is remarkable in that it shows a direct link between the interpretation of pain in higher centres (through the hypothalamus), the analgesia system (especially an area of the brain stem, namely the VL PAG) and passive emotional coping/ dissociation.**

Old vagal system

Freezing relies on unmyelinated vagal efferents originating in the dorsal motor nucleus of cranial nerve X (DMNX) (Porges 2003). The DNMX projects to the heart and bronchi, drastically slowing down the heart and respiration.

Porges describes the vagal system as a feedback system consisting of motor pathways to change visceral state, sensory pathways to monitor visceral state and brain structures to evaluate the sensory input and to regulate the motor output.

> 'Approximately 80% of the vagal fibres are afferent and provide important information regarding the visceral state.'
>
> 'The central regulator of the vagus in the brainstem is both an input and an output of other feedback systems; the vagal system becomes a component of a more integrated neural feedback system and a portal to neural systems in other areas of the brain.'
>
> 'There is a strong neuroanatomical and neurophysiological justification to predict that stimulation of the vagal afferents would change activity of higher brain structures.'
>
> Porges (2003)

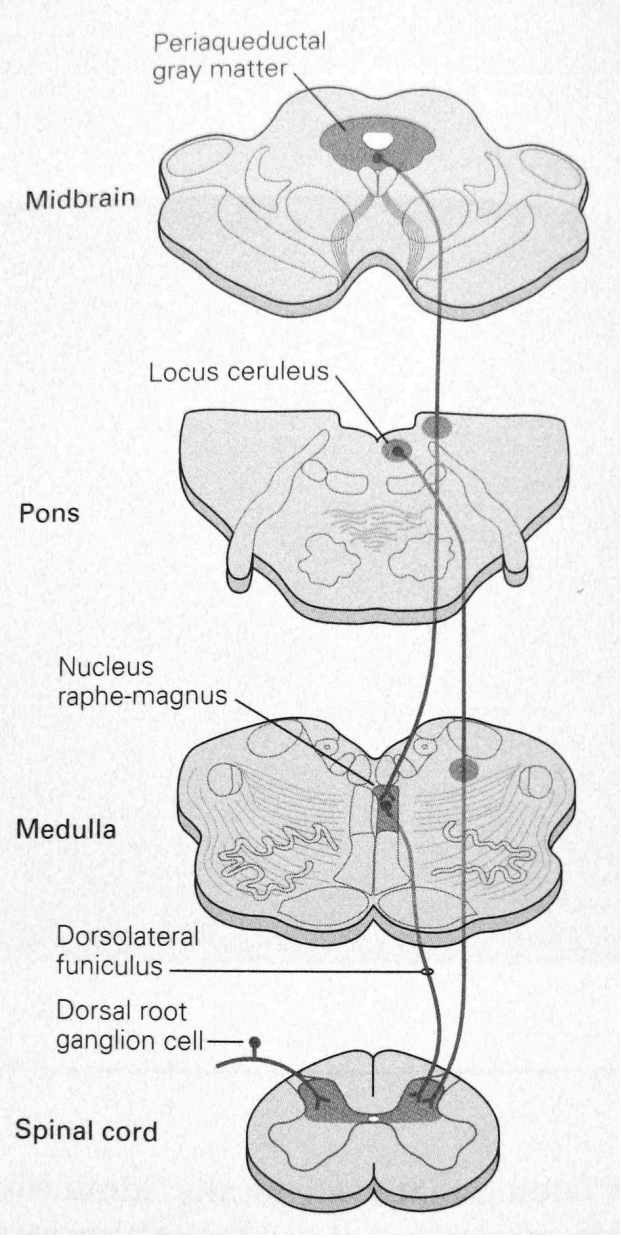

***Fig 1.2** Descending pathway from the periaqueductal gray (PAG) matter that regulates nociceptive relay neurons in the spinal cord*

Signs of overwhelm

Signs of sympathetic activation: fight or flight or hyperarousal

- Faster respiration (to get oxygen in)
- Quicker heart beat and pulse (to supply blood to the large muscles)
- Increased blood pressure
- Dilated pupils (to take in more light and information)
- Pale skin colour (blood is diverted away from the periphery)
- Increased sweating (there is an expectation of heat being generated in the mobilisation response, so sweating can be seen as a pre-emptive response to cool the body down)
- Cold, clammy skin (especially hands, due to less blood in the periphery and increased sweating)
- Decrease in digestive processes (including a dry mouth and contracted sphincters)
- Tingling muscular tension
- Startle response
- Increased flexor tension
- Emotionally this may be experienced as anxiety/panic, terror, aggression and everything happening too quickly and can create overwhelm.

Questions for fight or flight

- **Do you get cold hands or feet?**
- **Are you sensitive to bright lights or loud noises?** (do you get headaches on a sunny day?)
- **Are you more anxious than you would like?** (Is anxiety a theme in your life, have ever had panic attacks?)
- Do you experience tension in your jaw? (Does it lock or click, do you grind your teeth?)
- Digestive disturbances (e.g. IBS and food intolerances) are common: the digestive system is suppressed as it is not essential when fleeing prey. Constipation may be a result of sympathetic dominance, while parasympathetic dominance may result in diarrhoea, due to increased gut motility and relaxed sphincters.

Signs of parasympathetic activation: freeze or dissociation or hypoarousal

- Tonic immobility
- Numbing
- Dissociation
- Analgesia – this may be in the whole body, one side or one limb or a part of one limb
- Inability to move a limb, dreams of not being able to move (one client called this ‘sleep paralysis’)
- Inability to perceive the outline of the body (for example hands or feet feeling too big or too small or too close or far away)
- Inability to feel the skin as a sharply defined edge
- Sense of floating (this may be the whole body off the treatment couch, legs higher than the body or vice versa, or a sense of tilting from one side to the other)
- Sense of disconnection (commonly from below the neck or diaphragm or pelvis or feet)
- Low muscle tone (hypermobility)
- Emotionally this may be experienced as depression, withdrawal, feelings of unreality or not knowing, and lethargy. Dissociation can be a very frightening experience but can also be experienced as a dreamy, floaty, pleasant event – it is a place where you feel no pain.

Questions for freeze

- **Do you bump into things?** (Are you clumsy or knock things over or collect bruises)?
- **Do you drift off easily?** (Do you have a sense of being detached, have you ever been described as being in the clouds or spacey, do you find it hard to concentrate or do you drift off easily, have you ever been described as dreamy?)
- Nijenhuis (2001: Appendix) has developed a questionnaire with 20 questions to aid diagnosis of somatoform disorder. The questions involve grading statements such as ‘my body or a part of it feels numb’, ‘people and things look bigger than usual’, ‘I feel pain in my genitals (at time other than sexual intercourse)’. There are questions covering changes in smell, taste, seeing and hearing.

Connective tissue influences

Schleip (2003a) states that fascia is densely innervated by mechanoreceptors, which are intimately connected with the central nervous system and especially with the autonomic nervous system.

> 'Our richest and largest sensory system is not the eyes, ears, skin, or vestibular system but is in fact our muscles with their related fascia. Our nervous system receives its greatest amount of sensory input from our myofascial tissues. Yet the majority of these sensory neurones are so small that until recently little has been known about them.' The majority of the receptors are the poorly researched 'interstitial muscle receptors'.

Schleip (2003a) further states that the interstitial receptors function as pain receptors and mechanoreceptors and

> 'have been shown to have autonomic functions, i.e. stimulation of their sensory endings leads to a change in heart rate, blood pressure, respiration, etc.' 'It seems that a major function of this intricate network of interstitial tissue receptors is to tune the nervous system's regulation of blood flow to local demands, and this is done via very close connections with the autonomic nervous system.'

This feedback from myofascial tissues to the ANS leading to local regulation of blood flow would seem to provide a sensitive mechanism where the ANS could influence muscle tone. Theoretically this could make a contribution to the low muscle tone/ hypermobility found in dissociated clients.

Schleip (2003b) further explores connections between the ANS and fascia. He describes three possible mechanisms: changes in local fluid dynamics, changes in intrafascial smooth muscle cells and global muscle tonus change due to 'hypothalamic tuning'. His article states,

> 'It now appears that fascial tonus might be influenced and regulated by the state of the autonomic nervous system'; 'any intervention on the fascia is an intervention on the autonomic nervous system.'

Unfortunately, in common with most writings from a bodywork/chiropractic perspective, the ANS focus is on sympathetic influences. There is no discussion of parasympathetic overwhelm and the consequences of dissociation.

Causes of dissociation

Levine (1997) states that **trauma is anything that overwhelms our resources.** It can be one big event or an accumulation of smaller events. Dissociation seems to be particularly connected to the experience of feeling helpless. Levine lists the following common traumatic antecedents:

- Foetal trauma (intra-uterine)
- Birth trauma
- Loss of a parent or a close family member
- Illness, high fevers, poisoning
- Physical injuries, including falls and accidents
- Sexual, physical and emotional abuse, including severe abandonment or beatings
- Witnessing violence
- Natural disasters
- Certain medical and dental procedures
- Surgery, particularly tonsillectomies with ether, operations for ear problems or lazy eye

Sills (2004:383) argues that low-level chronic nociception and inflammation can cause higher-level facilitation. This can cause overwhelm responses in the autonomic nervous system similar to PTSD symptoms. This model develops the idea of a facilitated segment to include the brainstem and limbic system and a central sensitised state. Overwhelm in these parts of the brain can occur from below up (from the spinal cord and periphery) and from above down (cortex).

Summary

Dissociation is part of the body's response to overwhelming stress. It has well-documented physiological consequences that affect the internal mapping of the body, posture, and tone in the myofascial system. It is part of a range of responses that can be described as communication, mobilisation and freezing. Freezing is an often-overlooked response in movement and bodywork therapies, which tend only to focus on the fight or flight acute stress reaction. Dissociation can be an extreme experience of prolonged numbing with a sense of disconnection from an embodied reality. It is a well-recognised phenomenon in the psychiatric profession and among body psychotherapists working with traumatised individuals. The literature from these professions makes extensive reference to somatic symptoms associated with dissociation. It is not just a psychological event.

The overwhelm response involves the limbic system, brainstem and autonomic and somatic nervous systems. Facilitation of the brainstem can lead to dissociation. The behavioural significance of pain, interpreted in higher centres via the hypothalamus can excite areas of the brain stem (the VL PAG) causing a characteristic response of quiescence, vasodepression and sympatho-inhibition, also termed passive emotional coping.

The dorsal motor nucleus of the old vagal system of the parasympathetic nervous system drastically slows down heartbeat and breathing.

There are extensive afferent fibres from myofascial tissues to the ANS. Feedback from these afferent fibres seems to regulate local blood flow and could affect muscle tone.

My clinical experience indicates that dissociation is a common subclinical experience that confuses the communication between the somatic nervous system and the brain. Dissociation limits afferentation (incoming nerve signals) to the nervous system. It follows, therefore, that **it is extremely important to clear dissociation to allow bodywork interventions to be fully effective.** Signs of parasympathetic and sympathetic hyperarousal often coexist. Too much change too quickly may be perceived as a threat and may even provoke an overwhelm response in a client holding unprocessed traumatic reactions.

Dissociation is often associated with conditions that present as musculoskeletal pain. Clients with an element of dissociation often find it difficult to focus on simple body sensations; this can be in their whole body or a part of their body. Common feedback might be feeling numb, disconnected, as if they are floating; they cannot feel a clear sense of their skin, their body may feel too big or too small. Orientating to body sensation in a slow, contained manner can be a useful step in resolving dissociative states.

Clinical Example

I was referred a client by an osteopath who had treated a 40 year old woman for chronic low back pain and pain in her right hip. She had treated the client for approximately ten sessions with little improvement. The pain varied between the right hip and lower back, but rarely occurred together. On referring the client to me the osteopath said of the client, **'her pelvis has not got a brain**': the pattern of biomechanical dysfunction was always shifting.

In the case history she said yes to cold hands and feet, yes to sensitive to bright lights, yes to feeling a bit spacey and yes to being clumsy. She experienced periods of anxiety and ground her teeth. On asking her to focus on simple body sensations she felt withdrawn and not connected to her body. She could not really feel anything below her hips. We started working primarily with body awareness and craniosacral hands-on work. In the second session there was a clearer sense of connection and feeling in her legs but an absence of feeling around her right hip. Over five sessions her pain levels decreased as her ability to map her internal environment increased.

In my opinion the adjusting she had received previously had not worked as there was a clear dissociative element to her condition. If the nervous system cannot map the somatic structures because of analgesia then the motor output to maintain the correct tone will be confused. This often leads, as in this case, to bizarre migratory symptoms that are hard to relate to biomechanics.

Resources

Very little has been discussed about treatment of people experiencing some degree of dissociation. My experience has been that biodynamic craniosacral therapy is incredibly effective for helping clear dissociative responses. From the body psychotherapy perspective Rothschild (2000) is a great place to start. Levine (1997) is also excellent but aimed more at the general public.

Some useful websites are:

www.trauma-pages.com/
www.ncptsd.org/publications/pilots/
www.vaonline.org/trauma.html

www.stevehaines.net
www.cranialintelligence.com
www.bodyintelligence.com

A version of this article appeared in The Fulcrum in Jan 2008. See www.craniosacral.co.uk

References

Bove, G.M. and R.S. Swenson, 'Nociceptors, Pain and Chiropractic', Ch 9 in D Redwood, CS Cleveland (eds) *Fundamentals of Chiropractic*, Mosby 2003

Engel, C. 'Somatization and Multiple Idiopathic Physical Symptoms: Relationship to Traumatic Events and PTSD', Ch 8 in PP Schnurr, BL Green (eds), *Trauma and Health: Physical Consequences of Exposure to Extreme Stress*, American Psychological Association 2004

Guyton, A.C. and J.E. Hall, *Textbook of Medical Physiology* 10th ed, Saunders 2000

Kandel, E., J. Schwartz and T. Jessell, *Principles of Neural Science* 4th ed, McGraw-Hill Education 2000

Levine, P. and A. Frederick, *Waking The Tiger – Healing Trauma*, North Atlantic Books 1997

Lumb, B.M. 'Inescapable pain and escapable pain is represented in distinct hypothalamic-midbrain circuits: specific roles for Aδ- and C- nociceptors', *Experimental Physiology*, The Physiological Society 2001

Nijenhuis, E.R.S. 'Somatoform Dissociation: Major Symptoms of Dissociative Disorders', *Journal of Trauma and Dissociation* 1(4) 2000

Porges, S.W. *The Polyvagal Theory: phylogenetic contributions to social behavior*, Elsevier Science 2003

Redwood, D. and C.S. Cleveland (eds), *Fundamentals of Chiropractic*, Mosby 2003

Rothschild, B. *The Body Remembers – The Psychophysiology of Trauma and Trauma Treatment*, WW Norton 2000

Shapiro, F. *Eye Movement Desensitization and Processing – Basic Principles, Protocols and Procedures* 2nd ed, The Guildford Press 2001

Sills, F. *Craniosacral Biodynamics – Volume Two: The Primal Midline and Organization of the Body*, North Atlantic Books 2004

Souza, T.A. *Differential Diagnosis and Management for the Chiropractor* 2nd ed, Aspen 2001

Schleip, R. [2003a], 'Fascial plasticity – a new neurobiological explanation' Part 1, *Journal of Movement and Bodywork Therapies* January 2003

Schleip, R. [2003b], 'Fascial plasticity – a new neurobiological explanation' Part 2, *Journal of Movement and Bodywork Therapies* April 2003

Van der Kolk, B., A. McFarlane and L. Weisaeth (eds), *Traumatic Stress: the effects of overwhelming experience on mind, body and society* 1996