

Bachelor of Osteopathy

Adaptation ideas in osteopathy and its relevance for patients presenting with nonspecific low back pain

Written by

Kristiane Berglyd, student number 101455

Liselotte Bryngelsson Lund, student number 101594

18/5 2015

VF 200

Bachelor i Osteopati

Antall ord: 9654

Mai, 2015

Norges Helsehøyskole – Campus Kristiania

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Foreword

Both authors of this thesis have a background from nursing. Having worked within different fields of public health care, we became curious to compare the foundational idea of adaptation in osteopathy, and the perspectives on health and illness with conventional medicine.

The intuitive conviction by John M. Littlejohn that osteopathy is the science of adaptation, and the work of George Canguilhem defining health as the ability to adapt, helped us to see the major relevance of adaptation in understanding health and illness. The further work by Stephen Tyreman, distinguishing dispositions and functions, has been of great help to see how the idea of adaptation relates to clinical care.

We would like to thank Stephen Tyreman that he gave us confidence in our ability to see the connections that we found far from obvious in the beginning.

Kristiane Berglyd, Oslo 13/5 2015

Liselotte Bryngelsson Lund, Drøbak 13/5 2015

Abstract

A substantial amount of patients, seeking primary health care, suffer from conditions where a clear pathological lesion cannot be found. These conditions, categorized as medically unexplained symptoms, can cause disability with the same severity as those that originate from organic pathology. Nonspecific low back pain is one of the many conditions categorized as medically unexplained symptoms. Many attempts have been made to find the cause of the problem, but there is no common consensus regarding causal factors existing today. Researchers on Medically Unexplained Symptoms (MUS) criticize the foundational ideas of reductionism, dualism and linear cause-effect relationships in health care sciences because it fails to include individual variety and context sensitivity. A new ontological model is needed that can be an alternative to the separation of physiological and psychological processes, and the one-dimensional tendency to solely explain illness/ disease from the micro level. We will explain why the foundational assumptions following the biomedical model do not work well when approaching patients that suffer from MUS. Further we will describe the prevalence, management and suggested pathology of NSCLBP and relate this to stress-physiology and allostatic load. Finally we will present the foundational idea of adaptation and explain how emphasizing the adaptive ability of the individual can embrace both context sensitivity and individual variety, and be a holistic alternative to reductionism.

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1.0 Introduction

The patients that benefit from osteopathic treatment will mostly have an illness or a functional problem rather than a pathological lesion. The prevalence of patients that can be categorized as suffering from MUS constitutes significant numbers within primary health care. Studies show that up to a third of the physical symptoms that cause patients to seek primary health care are medically unexplainable (1). Considering that the majority of patients consulting osteopaths will lack a proven pathological cause for their symptoms ignited an interest for this extensive phenomenon.

1.1 The phenomenon of MUS and the idea of adaptation

MUS include a wide range of symptoms. Examples of MUS are conditions such as chronic fatigue syndrome (CFS/ME), irritable bowel syndrome (IBS), chronic low back pain (CLBP), general anxiety disorder (GAD), tension-type headache (TTH), post-traumatic stress disorder (PTSD) and fibromyalgia (FM) (2).

Based on recent research it is evident that efficient management of patients with MUS is a great challenge for all health professions. A common denominator seems to be that these patients have a history of being misunderstood, misdiagnosed and inefficiently cared for (1, 3, 4, 5, 6, 7).

There is a growing awareness among researchers on MUS that a fundamentally new approach is needed to help and support these patients efficiently. This tendency leads all the way down to the ontological framework dominant in modern healthcare and how we understand health and illness.

In respect of patients presenting with MUS, researchers highlight three problems regarding the ontological framework dominant in modern healthcare:

1. The tendency to look for a single, simple cause for illness and a linear cause/ effect relationship.
2. Psyche and soma has been divided.
3. The multiple functions of the body have been treated as separate parts.

This tendency of thinking in terms of mono-causality, reductionism and dualism has so far been insufficient in order to understand the phenomenon of MUS.

Researchers on MUS argue that neither the biomedical nor the bio-psychosocial model is suited to deal with these patients. A new model is needed that will embrace causal complexity, individual variety and context sensitivity (1, 3).

Within biology adaptation is defined as a change, or the process of change, that makes an organism better suited to its environment (8). The foundational idea of adaptation has been stressed in osteopathy, beginning with John Martin Littlejohn (1867 – 1947). Littlejohn was convinced that it was the ability to adapt that was determining the health for the individual and he claimed osteopathy to be the science of adaptation.

Littlejohn put major importance on how physiological body parts were able to adjust to the changing environment and how these body-parts were able to relate to one another. From an osteopathic perspective it is emphasized that we are individuals constantly adapting to changing circumstances in both the internal and the external environment. Our functional capacity depends on this adaptive ability (9, 10).

For the purpose of confining our subject of study we have chosen to focus on nonspecific low back pain (NSLBP).

Nonspecific low back pain is defined as back pain localized between the lowest rib and gluteal creases with or without leg pain and with no definitive cause. It can be defined in subgroups of acute or chronic. There is no clear consensus on when sub-acute pain becomes chronic. Some researchers say that chronic back pain is pain that has lasted for longer than 7 – 12 weeks. Others classify frequently recurring back pain as chronic pain - since it intermittently affects an individual over a long period. Snelgrove et al (2009) defines chronic back pain as pain that lasts beyond the expected period of healing. We prefer the last definition because it corresponds to the fact that the underlying pathological causes for back pain are not well understood. The prevalence and persistence of CLBP continues to be regarded as a complex phenomenon, difficult to treat, and challenging for patients and health professionals alike (11, 12).

By relating the foundational idea of adaptation to CLBP, we can describe MUS as a failure of adaptation and CLBP as a state of maladjustment.

1.2 Problem statement

“Can the foundational idea of adaptation within osteopathy offer a valuable perspective in comprehending causation and efficient patient care for individuals presenting with NSCLBP? ”

The bio-medical model combined with the bio-psychosocial model has not been successful in dealing with causal complexity, individual variety and context sensitivity (1, 2).

Our hypothesis is that the ideas of adaptation in osteopathy offer a complementary approach that can address these issues in a more sensible way.

The aim of our project is to clarify this connection and why it is important.

2.0 Method

This is a qualitative study performed through a systematic literature research in Bibsys Oria, helsebiblioteket.no, PubMed, Embase and the lecture information website at Norges Helsehøgskole: www.luvit.nhck.no. Personal communications with lecturer Christian Fossum, Ronja Strømsborg Lund, Pål Andre Amundsen and Stephen Tyreman added literature and studies to our material.

Research/key words: osteopathy, osteopathic medicine, osteopathic philosophy, chronic pain, health and illness, reductionism, holism, medically unexplained symptoms, osteopathic principles, professional values, adaptation, management of CLBP, biopsychosocial model, complementary medicine, back pain, chronic low back pain, John M. Littlejohn, George Canguilhem.

Only scientifically approved articles have been included in this study. We chose to exclude articles published earlier than the year 1999, with the exemption of 2 that we felt were important to include. The articles have been critically analyzed for information and theories on our subject.

We have used the following websites for supplementary information:
www.oxforddictionaries.com, www.who.int, www.knowyourback.org

Ethical aspects, other than following academic rigor in terms of referrals, have not been relevant to take into account, as this thesis is based on a literature study.

3.0 Results

3.1 Medically unexplained symptoms

A large percentage of people seeking medical care, represent with MUS. Studies show that up to a third of the physical symptoms that cause patients to seek primary health care are medically unexplainable. MUS are common throughout all areas of medicine for all ages and can cause disability as severe as those that originate from organic pathology. Many patients have more than one MUS. Overall, around 30% of patients with MUS have underlying psychiatric disorder, anxiety, depression or possible emotional distress are common. These disorders are often not diagnosed and treated.

However, it is important to highlight that patients with MUS are frequently labelled with mental disorders or psychological factors for which there is little real evidence (13, 4,14).

There are rehabilitation programs integrating treatments that include physical, psychological, educational, and family components. However, it seems that each program depends on the therapists' underlying conceptualization of somatoform illness. These vastly individual views on what the concept of somatoform illness might be, and what is causing them, is a problem when moving towards finding more effective treatment schemes for patients categorized as having somatoform illness/MUS (15).

Rolfe (2011) describes that the symptoms of MUS can be precipitated by organic illness, accidents, stressful life events and other environmental factors, such as media campaigns that highlight specific diseases. Other possible risk factors for MUS include severe illness or death of a close relative, childhood adversity or abuse and domestic violence.

As we will discuss, there are many studies that reveal the external environment to be the crucial factor when it comes to developing MUS and CLBP (ref chapters 4.2, 4.3)

3.1.2 Medically unexplained symptoms and the shortcomings of the biomedical and bio-psycho-social model

We described in our introduction that patients suffering from conditions categorized as MUS mostly do not receive sufficient support to cope successfully with their situation. The patient is typically sent for multiple investigations and when no explanation to the symptoms is found, patients are "labeled" as having a functional or somatoform disorder. The diversity of the presenting symptoms and the associated diagnostic uncertainty make them difficult to manage. Healthcare providers can feel incompetent in their diagnostic- and communication-techniques and the patient can feel that he/she is not being taken seriously (13).

The following citations exemplify what uncritical use of the biomedical and bio-psycho-social model may entail for the patients involved:

"...patients with unexplained neurological symptoms felt shame and guilt that an organic cause could not be found for their illness, threatening their sense of self and social identity" (5:185).

“...patients personal worries were systematically ignored by the doctors....in order to help their patients by the use of their biomedical model knowledge of anatomy and bodily processes, the doctor often handled the patients as objects” (3: 593).

“This study confirm the observation that patients and health professionals continue to interpret and to treat pain through a biomedical model of ongoing tissue damage. Many of the responses obtained suggest that the patient’s low back pain has not been explained to them in any other way than damage and deterioration” (6:112).

Patients with NSCLBP suffer prolonged symptoms and disability despite negative results of medical investigation. It is often frustrating for the patient to be told that the results of investigations are negative and at the same time not receiving any convincing explanation of their persisting distressing symptoms. A qualitative study published in 2012 shows that patients often are far from relieved when the doctor could not find anything wrong, even if the doctor present the results of diagnostic tests as really good news. The patients were seeking recognition of their pain as “real” with a physical cause. However, the patients also expressed a desire for a more holistic approach, which took into account the impact of pain in their lives without compromising the legitimacy of their pain (5, 16).

Ideally, the recognition and management of psychological factors would be carried out together with medical investigation. If psychological factors are discussed from the beginning in a convincing an acceptable way, the patients will feel more confident that their problems are taken seriously whatever the cause of their illness.

Emphasizing effective communication and a professional partnership approach to the patient has been seen as a way to reduce frustration in the clinical situation (5, 16).

Rolfe (2011) states that if there are no red flags or other symptoms that point you to an organic cause for the patient’s symptoms, and that an examination directed by the history fail to find any abnormalities, it is unlikely that there will be an organic cause for the complaint.

This is, however, a simplification worth questioning. The tendency to conclude that a disorder without a known physical cause has psychological causes is what Sykes (2006) describes as psychogenic inference.

“The psychogenic inference is the inference that if a disorder does not have a known physical cause, then its causes must be psychological [...] the difficulty with this line of reasoning is that the psychogenic inference is clearly unsound” (14:342).

Tyreman (2007) highlights that values are an important part of evaluating conditions where there is no clear pathological lesion. Relating this to back pain, it is actually possible to classify CLBP as a mental disorder.

“It is possible to designate that back pain, at least partially is a mental disorder because there is no good evidence of pathological change, psychosomatic elements are frequently identified as causal and psychological factors are clear predictors of chronicity” (17: 105).

Considering the citations from Tyreman (2007) and Sykes (2006) we have exemplified that the dualistic view promoted by the biomedical model causes major difficulties when dealing with patients suffering from MUS. This is also true regarding the bio-psychosocial model. The BPSM has been analyzed to have significant shortcomings because it is congruent with the biomedical model where ill health is constituted in terms of material malfunctioning in the somatic body. Even though the BPSM emphasizes the importance of understanding the patient's experience, the philosophical basis is still essentially mechanistic in terms of advocating reductionist dualism, separating psychological and somatic mechanisms. [Sentence a bit unclear].

This is an important issue because patients with MUS often fall off the grid within traditional health care since they have neither psychological (according to themselves) nor somatic problems (according to the health care practitioner) (4, 1).

We agree with Sykes (2006) that a rational approach to patients in general would be to appreciate that a psychological condition will always have physiological/ mechanical components, and vice versa:

“Sometimes, it is said that we should not ask whether a disorder is a physical or mental one. We should merely ask what the physical, psychological, or mental aspects of a disorder are and should refuse to ask the question as to whether the disorder is a physical or mental one” (14: 341).

3.2 Chronic pain

3.2.1 Definition and classification of pain

Pain is a subjective, unpleasant sensory and emotional experience.

Acute pain occurs when **A** noxious stimulus is present. Peripheral nerve and central systems in the spinal cord, brainstem, and forebrain can sensitize and ramp-up activity, but acute pain will remit with the natural course of tissue repair. In this way acute pain can be seen as a symptom and chronic pain as a disease (18, 19).

Pain is mainly categorized as acute or chronic and specific or nonspecific (ref chapter 2.0). It can also be classified as chronic non cancer pain (CNCP) or functional pain.

Traditionally, two classifications of CNCP have been identified: nociceptive and neuropathic. Nociceptive pain results from activation of primary afferent neurons by noxious stimuli, whereas neuropathic pain is initiated by a primary lesion or damage in the peripheral nervous system. More recently, functional pain has been recognized as a third classification. Functional pain syndromes (e.g. fibromyalgia and irritable bowel syndrome) are characterized by chronic pain and discomfort referred to different regions of the body; however, no generally agreed upon structural, inflammatory, or biochemical abnormalities have been identified to explain pain symptomatology. In this way we understand non – specific pain and functional pain to be overlapping terms (20).

3.2.2 Prevalence of chronic low back pain

According to Norwegian national guidelines for back pain this is the disorder that affects the most number of patients and which costs society the most. The life time prevalence of NSLBP has been reported to be 84 % representing a significant cost to society. In Norway around 2 million consultations are made every year related to back pain.

Low back pain is one of the most common conditions managed by outpatient physical therapists representing a great challenge for health professionals (21, 1, 22, 12).

Prevalence estimates vary depending on the definition of low back pain used. Definitions recorded have been that prevalence in the previous 6 months was 8% when low back pain was defined as requiring sick leave, whereas when it has been defined as pain lasting at least a day, prevalence has been 45%. Recognizing this problem, Fersum (2011) suggest that patients with NSCLBP can be sub - grouped on cognitive, physical, neurophysiological and lifestyle behaviors (22, 23).

In our opinion, considering that CLBP is a condition that like other medically unexplained symptoms have failed to be successfully generalized it is not plausible to state specific numbers of occurrence.

3.2.3 Pathophysiology of chronic pain/ chronic low back pain

Little is known about the precise cause of CLBP. There is often a mismatch between objective findings and symptoms. Despite advances in imaging, it has not been possible to determine whether identifiable structural or mechanical abnormalities are responsible for the symptoms in most patients. Moreover, even when anatomic abnormalities are detected, the significance is unclear, since bulging disks or annular tears are found in high percentages of asymptomatic individuals (24).

Investigating etiology of NSLBP can be confusing based on the fact that the etiology as we know it today is complex and unclear:

“Epidemiological failure to identify causal factors confidently informs the definition and nomenclature of NSLBP, as well as the categorization of NSLBP as MUS” (1:3).

No adequate psychological or organic pathology can be found and thus symptoms remain undiagnosed after medical examination.

Traditionally the cause of NSLBP has been related to mechanical stresses.

However mechanical factors like lifting, standing, walking, bending, carrying, twisting, manual handling and occupational posture have been reported as non – causative through systematic epidemiological study. Structural changes identified on imaging have been considered a causal factor and studies demonstrate that there is a relationship between pain, disc degeneration and disc space narrowing, however meta-analysis does not support causal claims (1:3).

Addressing chronic pain it is important to highlight that there are many potentially causal or reinforcing biological factors, however none of these factors can claim causal certainty. Examples of pathophysiological factors with weak causal claims are nerve growth factor, and tumor necrosis factor a, disc degeneration and disc-space narrowing (1).

A more thoroughly documented causal factor in chronicity is the adaptive function of sensitization. As pain evolves in the hours, days and weeks after tissue damage, the pain-producing mechanisms also evolve and change as time goes by, an essential factor is that of peripheral and central sensitization.

This is a form of conditioning that involves the amplification of a response following repeated administration of a stimulus. When the nociceptors sensitivity is increased by continuous stimulation the phenomenon is called sensitization. Sensitization of nociceptors can partially explain why a stimulus that normally does not cause pain, like slight touch or moderate heat, will cause pain when a tissue is inflamed. Peripheral sensitization is a reduction in threshold and an increase in responsiveness of the peripheral ends of nociceptors, the high-threshold peripheral sensory neurons that transfer input from peripheral targets (skin, muscle, joints and the viscera) through peripheral nerves to the central nervous system (spinal cord and brainstem). Central sensitization is characterized clinically by hypersensitivity to mechanical stimuli, and neurophysiologically by significant increases in the membrane excitability and synaptic efficiency of spinal neurons involved in nociception. This is coupled with reductions in counteracting inhibitory pathways. The longer the patients are exposed to chronic pain, the more sensitization mechanisms are stressed leading to greater pain scenarios. This means the longer the patients experience chronic pain patterns, the more intense these patterns may become and the harder it will be to relieve the pain syndromes (25, 26, 19, 27).

People with chronic pain often experience many stressors. Sleep deprivation and financial difficulties are common occurrences. They often feel anger, fear, anxiety, powerlessness, and guilt in response to the multiple losses associated with pain, decline in physical ability, and inadequacy of role fulfilment. These stressors, along with negative affective states, increase the allostatic load, placed on the neuroendocrine and immune systems. When the immune system is compromised, the anti-nociceptive effects of immunocytes involved in endogenous pain inhibition are greatly reduced. Acute and chronic psychological stressors may also contribute to hyperalgesia via immune-to-neural mechanisms, although the physiological mechanisms are not well understood (20).

Individual differences in pain sensitivity have long remained a perplexing and challenging clinical problem. How can one individual have a sensory experience that is vastly different than that of another, even when they have received similar sensory input? Developing an understanding of such differences and the mechanisms that support them has progressed as psychophysical findings are integrated with measures of brain activation, e.g. brain imaging techniques.

The brain is involved in creating pain from different factors such as the stress-response, earlier experience with pain, anxiety and cognition. Across all sensory modalities, our individual experiences are unique (28, 18).

To understand the mechanisms of chronic pain it is of importance to consider the structural/functional interactions of the musculoskeletal, immune, neurologic, and endocrine (MINE) systems in response to nociception. The four systems of the MINE system demonstrate feedback effects that can be both facilitating and inhibiting. Each of the MINE subsidiary systems has an inherent capacity for self-regulation, self-learning, and health maintenance. Any one of these subsidiary systems can also break down. Chronic pain therefore is likely an effect or consequence of system breakdowns or dysregulation/ mal adjustment (27).

3.2.4 Risk factors for developing chronic pain/ chronic low back pain

The mismatch between anatomic abnormalities and symptoms has led to studies of the psychosocial factors that may contribute to CLBP. These studies suggest that increasing age, female sex, and lower levels of formal education, depression, stress, job dissatisfaction, and disability/compensation issues may play some role in expression of symptoms and in chronicity. A study on chronic pain in the Norwegian population suggests that women, older individuals, persons with less education, and those who were pensioned would report chronic pain more frequently. A predominantly quantitative line of research further confirms that the risk factors of developing chronic pain often are subject to loss of employment, socioeconomic deprivation, subsequent depression and social isolation. Patients with chronic pain have higher rates of depression than the general population and many of those with CLBP endure distressing experiences marked by catastrophizing, passive coping, low self-efficacy and high levels of anxiety that are purported to predict and maintain chronicity. In a case control study made in 2005 fear-avoidance beliefs are pointed out to be one of the most important psychosocial factors in predicting disability among patients with CLBP. McEwen (2002) states the puzzling observation that the major risk of disease today is socioeconomic status and that an even better predictor is what you perceive your socioeconomic status to be (29, 24, 30, 12, 31, 32, 33).

We can conclude that psychosocial components play an important role in predicting risk factors for chronicity. However regarding the problems of defining CLBP (ref chapter 4.2.2.), risk factors also differ with the definition of low back pain used, making comparisons between studies difficult (22).

3.2.5 Management of chronic low back pain

In the study of Snelgrove (2009) the estimates indicate that approximately 85% of primary care patients presenting with back pain, have ‘non-specific’ pain where treatment is based upon symptom management.

These patients seek consultations with doctors, physiotherapists, manual therapists, chiropractors and other healthcare providers (21).

It has been stated that caring for CLBP is one of the most difficult and unrewarding problems in clinical medicine, as no treatment has been shown to be clearly effective.

The limitations of diagnostics and management with the perceived failure of the health care system to recognize, find a cause, or recommend an effective treatment, has all contributed to feelings of frustration for both patients and healthcare providers. For chronic low back pain clinical practice guidelines seem to agree on the recommendations of having brief education about the problem, advice to stay active, non-steroidal anti-inflammatory drugs, weak opioids (short-term use), exercise therapy (of any sort), and spinal manipulation. Self-management strategies for example health promoting activities, self-monitoring of status and decision making are receiving increasing attention as important components in the management of low back pain. Secondary recommendations include multidisciplinary rehabilitation, adjunctive analgesics, cognitive behavioral therapy, and strong opioids. Antidepressants are presented as second line treatment for patients with persistent low back pain in some guidelines, showing a small to moderate benefit, although possibly no greater than placebo, and with a high risk of side-effects (22).

The Norwegian national guidelines (21) state that unspecified long term low back pain treatment should include advice on normal activity. General activity should be as normal as possible to non-dramatize the situation and sick leave should be as short as possible. Bed rest should only be necessary in rare cases when 2-3 days of pain relief is needed. Exercise and training should be recommended after a few weeks of normal activity. Manipulation therapy can be recommended for pain relief and better function after 1-2 weeks (21).

The effect of exercise therapy and manual therapy on chronic low back pain with respect to pain, function, and sick leave have been investigated in a number of studies. The results are, however, conflicting. In what follows, we describe three studies by looking at different interventions for patients dealing with CLBP. The first study concludes that patients receiving manual therapy had significantly better results than patients performing physical therapy. The second study found that there is no difference in treatment outcomes comparing spinal manipulative therapy with other standard treatments. The third study states that there are no significant differences in treatment outcome comparing manual treatment with other common approaches and that there are poor long term effects for all treatment interventions.

In a RCT study made in 2003 the effects of manual therapy was compared with exercise therapy in sick-listed patients with chronic low back pain. Although significant improvements were observed in both groups, the manual therapy group showed significantly larger improvements than the exercise therapy group on all outcome variables throughout the entire experimental period, both on short and long-term follow-up (34).

In a review from 2013 the conclusion was that there is no evidence that spinal manipulative therapy is superior to other standard treatments for patients with acute or chronic low back pain. A study comparing the efficacy of general exercise, motor control exercises and spinal manipulation concluded that there is little basis on which one to prefer (35).

According to a study made in 2011 regarding management of non-specific chronic low back pain (NSCLBP) it seems that interventions such as manual therapy, exercise, acupuncture, spinal injections and cognitive behavioral therapy as single interventions are not superior to each other, have a limited long-term impact on the disorder and small effect sizes (23).

As we have shown there is lack of evidence regarding single treatment interventions for patients with NSCLBP, despite the substantial amount of Randomized Controlled Trials evaluating treatment outcome for this disorder.

It has been hypothesized that this vacuum of evidence is caused by lack of sub-grouping and targeted management. Another reason suggested is the failure to adequately deal with NSCLBP within a multidimensional biopsychosocial framework (35, 23).

3.3 Homeostasis, stress and allostatic load

3.3.1 Stress, allostasis and homeostasis:

Stress can be described as longer term change and development in an individual. It is the pressure life exerts on us and the way this pressure makes us feel.

This corresponds to what people relate to when they talk about stress in daily life. It is commonly used as a negative term and relates to the external environment. McEwen (2002) stresses that the term “stress” is outmoded and that allostasis is a better term to understand the stress-response also called the fight or flight response:

“Allostasis, when functioning smoothly, is what empowers us to handle and adapt to changes in our environment. Even if we perceive those changes as stressful, the intricate, elegant system of allostasis exists for the very purpose of helping us to cope” (33:41).

Allostasis is the system of communication that links the brain, the endocrine system and the immune system in such a way that the body can remain stable and provide enough energy to deal with change. The fight or flight response is meant to ensure safety and survival but when it is overwhelmed it becomes allostatic load. Allostatic load refers to the damage that the allostatic response causes when it is not functioning properly (33).

Homeostasis refers to the mechanism that provides for the body’s need to maintain a constant state. We understand the difference between allostasis and homeostasis in the way that homeostasis is short term while allostasis also includes long term changes.

3.3.2 Stress – a global response

The stress-response helps us to react to an emergency and cope with change. To do so, it musters the brain, glands, hormones, immune system, heart, blood and lungs. In this way no part of the body is unaffected. A stress-response is the response that facilitates an organism’s adaptation to homeostatic challenge. It can be viewed as the organism’s pattern of reaction to an internal or external stimulus. The stimulus may be life – threatening or merely perturbing; it may be the lack or presence of something, but it is sensed as challenging the organism’s current set point for adequate functioning in such a way that defensive actions are necessary (19, 33, 26).

The HPA axis is the cornerstone of allostasis and allostatic load. This is where the nervous system, glands and immune system are brought together and held in balance – or not as the case may be. The HPA – axis is responsible for the adjusting phase of the allostatic response. The hypothalamus secretes a substance called corticotropin releasing factor that eventually leads to release of cortisol (33).

3.3.3 The interdependence of body and mind

Reflecting on the intimate connection between body and mind can help us comprehend the heterogeneity of MUS and why the many attempts to generalize these conditions have failed to succeed (ref 2.0).

The connection between perception and physiological response is so strong that we can set off the fight or flight response by just imagining ourselves in a threatening situation. Why allostasis become allostatic load in some people and not in others may have to do with our emotional reactions to situations. The interconnections between bodily processes and emotion are most clearly understood as they occur in the stress-response. Emotions may originate in the brain but they are never the less a result of the links between the brain and the endocrine system. To understand allostasis it is important to recognise that it all begins in the brain.

The connection between the hypothalamus and the pituitary gland is important in how we understand that mental stress affect allostasis and allostatic load.

The neurotransmitter corticotropin releasing factor from the hypothalamus plays a major part in activating the global stress-response. There are also found cortisol receptors in the hippocampus formations implicating that the brain can be the target as well as the initiator of the stress-response (33).

Given continuing controversy over the “psychosomatic” nature of chronic widespread pain, it is interesting that release of the inflammatory neuropeptide substance P (SP) can be induced by “psychological” as well as “physical” stimuli. This implicates that psychological stress may cause elevated levels of SP in the tissues amplifying sensitization and the following increase of pain (25).

We can conclude that the brain determines and regulates behavioral and physiological stress-responses, the latter through the autonomic, immune, neuroendocrine, and metabolic systems that may result in successful adaptation or lead to allostatic load and disease. This is partly based on the fact that there are stress hormone receptors in the hippocampal formation (33).

3.4 Reflections on the concept of health

3.4.1 The view on health dominant today

Questioning the biomedical framework within the healthcare sciences it is necessary to reflect on what is meant by health. At first this may seem self-evident, but, as we will describe, the concept of health is not easily defined.

A well-known definition of health is the one cited by WHO in 1948:

“Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (36).

This definition makes a point of avoiding the simplistic understanding that lack of health is synonymous with disease and vice versa. However critics argue that the WHO’s definition of health is utopian, inflexible and unrealistic. Including the word “complete” also makes it unlikely that anyone would be healthy for a reasonable period of time (37).

We will also point out that the definition of health by WHO is rather a description of a state following health; it is not addressing health in itself.

3.4.2 Perspectives on health by Littlejohn and George Canguilhem

The french philosopher and physician George Canguilhem (1904 – 1995) claimed that there is no science of health. By this he meant that the definition of health is rough and inexact and therefore lack scientific status.

He preferred to consider health as a crude concept and philosophical question. Thinking about health as a philosophical topic he draws on the definition by the French surgeon Rene Leriche (1936):

“Health is life lived in the silence of the organs” (38: 467).

He explains further that in health one does not feel the movements of life and that all functions are accomplished in silence. We are well when no part of the body informs us of its existence, when we become acutely aware of our bodies it is because we are ill (38).

There are similarities between the observations of Canguilhem and the ideas of John Martin Littlejohn (1867 – 1947).

According to Littlejohn osteopathy is the science of adaptation based on the emphasis on physiological body parts and the ability of those parts to adjust in response to changing conditions. Littlejohn emphasized that the role of the osteopath is not to correct mechanical lesions but to enable normal physiological relationships (10).

In the following statement we can see that Littlejohn was convinced that it was the ability to adapt and the relationship between organs and body-parts that was determining health for the individual. Describing this in the year of 1902 Littlejohn was way ahead of his time.

“What is health? It is the ability on the part of the organs in the different parts of the body each to perform its normal function in harmony with all the other organs and parts. Ill health is the inability to do this. Disease is the result of that ill health. That is the basic idea of the osteopathic system. Health then is a condition in which every member or part is adjusted to every other member or part of the organic system” (9: 22).

This foundational idea of adaptation in osteopathy seems to be congruent with the following observations by Canguilhem:

“Canguilhem regards normality and health as being functional characteristic of the whole organism. He defines health as the ability of the organism to adapt to challenges posed by the environment, to create new norms for new settings. For him normality is measured by the adaptability of the individual [...] disease is defined, not at the arbitrary point within the range of biological variation, but by the functional meaning of any disturbance of the whole organism. Health for Canguilhem, means being able to be sick and recover. By contrast to be sick is to be unable to tolerate change” (39:317).

According to Tyreman (2003) Littlejohn disagreed with the idea that the function of body-parts are straightforwardly determinate and that an “ideal” body would guarantee perfect health. This may be the same Canguilhem refers to when he declares that biological variation in itself is not disease.

What is essential when defining disease is how the influence affects the organism as a whole (38).

Canguilhem also made a distinction between mechanisms and organisms and refused to reduce health to a matter of mechanics:

“Health, the body’s truth, does not arise out of an explanation of theorems. There is no health of a mechanism.. for a machine the operative state is not health, and disorder is not disease” (38:471).

According to Tyreman (2003) Littlejohn often used the term vitality to distinguish osteopathy from a purely mechanical approach. The term vitality is poorly defined but we understand it to be an essential characteristic of living organisms.

As we have explained Littlejohn and Canguilhem both saw health as the ability to adapt to the environment. The vitality Littlejohn referred to may relate to what Canguilhem describes when he states that there is no health of a mechanism. In this way we assume that health and vitality point to the same phenomena of adaptability.

The way we understand Littlejohn is that he criticized those who performed osteopathy purely from a biomechanical approach because they did not comprehend the complexity of adaptation.

3.4.3 The health – disease continuum

The foundational ideas of osteopathy have been compared to have similarities with the concept of salutogenesis by Aaron Antonovsky (Tyreman, 2015 personal communication).

Antonovsky stressed that we should look at what creates health rather than only the limitations and causes of disease. This corresponds to the famous statement by A. T. Still that the object of the doctor is to seek health and that anyone can find disease (40, 27).

Antonovsky wanted a new theoretical framework for health promotion that was concerned about studying health in itself. He studied and analyzed the resources that are supporting us in moving towards health. Antonovsky criticized the assumption that you are either healthy or ill. Instead he described health as an ease/ disease continuum between total health and ill health. One can simultaneously have both healthy and unhealthy components. Salutogenesis was defined as the process of movement toward the health end of a health/ disease continuum (40).

This idea has been embraced within the osteopathic tradition. Stone (1999) articulates it this way: “..the concepts of health and disease should be viewed as a continuum, in that health is the optimum state for a person to be in and disease is a movement away from health” (41:20)

Within the salutogenic approach there are two key concepts: sense of coherence (SOC) and generalized resistance resources (GRR) that are foundational for our experience of health. With a strong SOC one has confidence that the internal and external environment will be structured, predictable and explainable. This will enable people to view life as coherent, comprehensible, manageable and meaningful. To develop a strong SOC the need for meaningful activities, contact with one’s inner feeling and social relations have to be met.

GRR are prerequisites for developing SOC. GRR can be found within people or in the environment and it refers to material and non- material qualities. Examples of this can be money, housing and self- esteem.

Research show that people who develop a strong SOC live longer, tend to choose positive life behavior, manage stress and negative life events better and manage better if struck by illness or disease (40).

Referring to the apparent fact that we are constantly relating and changing it is implicit that life never can be controlled completely. However Antonovsky claims that the unpredictability of life also is part of the salutogenetic framework. Having a strong SOC will enable us to deal more smoothly with uncertainty and chaos (40).

3.4.4 Health as agency

Tyreman (2006) defines health as the ability to perform taken for granted activities. Health is seen as the ability to function and the aim of osteopathic treatment is to adjust those factors that limit our ability to act.

This is seen in the light of Irwin M Korr’s statement that the neuro- musculoskeletal system is the primary machinery of life. By this Korr meant that the musculoskeletal system is the ultimate system for carrying out human action and behavior and that it is only through the musculoskeletal system that we are able to manifest our human qualities and personal uniqueness.

He also meant that human life is valued for the ability to act and being an agent (27, 10).

Stone (1999) also relates to health as the ability to function depending on context: “The real measure of health is the ability to function in a manner acceptable to himself and the group which he is part” (41: 4).

She also highlights that it is not the disease process that determines if a person is healthy or not, it is the ability to act: “..the more able a person is, the more healthy” (41:5).

We think that defining health as the ability to function and being an agent is a good choice because it promotes context sensitivity and allows for holistic complexity, with the imperative that function is understood as a relational concept (ref chapter 4.5.1).

3.5 The foundational idea of adaptation in osteopathy

Reflecting on adaptation, adaptability and its application to healthcare we realise that this has far reaching connotations. Indeed it leads all the way back to what it means to be human. To be human is dependent on two absolute axioms:

1. We are constantly relating to internal and external factors.
2. Change is inevitable.

To enjoy good health and lead the life we aspire we are dependent on constantly being able to adapt to change in both the internal and the external environment (ref chapters 4.4.2, 4.4).

For further clarification the process of adaptation can be described in 3 different stages

1. Homeostasis: moment to moment adaptation
2. Stress: longer term change and development in an individual.
3. Evolution: long term adaptation to changed environmental conditions in a population.

From this perspective we can see life as a continuous relationship to other living beings, to gravity, to climate and so on. We are always individually adapting to constantly changing circumstances in both the internal and the external environment. Our functional capacity depends on our ability to adapt. In this context chronic pain can be seen as maladjustment and MUS overall as a failure of adaptation (S. Tyreman, personal communication 2015).

3.5.1 Dispositions, functions and the importance of context

Defining health as the ability to act and be functional it is relevant to take a closer look on function and what function means.

Tyreman (2003) argues that function in a biological context is a relational concept, meaning that it is not possible to understand the function of a part without recognizing the system that the function appears in. A function describes the way a part relates to the whole and not merely to another part.

Applying this to human beings we understand this to be not only about how body- parts and organ-systems enter functional relationships, rather it is also about what people do and how they experience the life they are living.

Tyreman (2003) clarifies the meaning of function by distinguishing functions and dispositions. “Cells and tissues simply do what cells and tissues do; they don't have functions only dispositions. Muscle fibers have properties that dispose them to shorten when stimulated, nerve fibers pass a current, and red blood cells combine chemically with oxygen and carbon dioxide.

It is only when these dispositions or properties combine to form a system with the capacity, say, to lift a bag or walk upstairs that we can properly refer to function” (10: 9).

A disposition does not have a function in itself but when multiple dispositions operate to form a system then we have a capacity/ function that can be utilized to form an experience of agency. On the other hand multiple dispositions can form a dyscapacity and consequently a loss of agency. Dispositions can enter a variety of relationships and can therefore be part of many different functions. What functions the dispositions will be part of are entirely dependent on context. Because of this this sensitivity to context, the human body is amazingly adaptable:

“The body consists of numerous dispositions that can be utilized to achieve an almost limitless number of ends. The human body is amazingly adaptable” (10: 11).

Reflecting on the differences between function and dispositions is interesting because these are phenomena that require different strategies for understanding. It is feasible to understand dispositions through studying details out of context; however this is not applicable when we want to understand functions. The experiences of function/dysfunction are informed by values (10).

By this we understand that a person’s sense of agency/ loss of agency will be informed by culture, lifestyle, personal experience and expectations. This implicates that we cannot fully understand a function by merely focusing on well-defined details, it is necessary to analyze the complex relationships that forms the existential basis of the function. We understand this to include relationships on all levels both in the internal and the external environment of the individual.

Applying this to a clinical context we would like to draw on the conclusions from Eriksen et al (2013). They suggest an alternative ontology called “dispositionalism” that they argue will be better suited to deal with the key issues of MUS (monocausality, reductionism and dualism), (ref chapter 2.0).

Summed up, the important characteristics of dispositions are that they can exist unmanifested, that they can contribute to bring about a number of effects and that the effect it contributes to produce, will depend entirely on the context it appears in. Coming from this perspective the fact that two people can have vastly different effects from being exposed to a virus or bending and lifting a heavy load makes sense.

Eriksen et al (2013) points out that the search for a biomedical cause and treatments of psychological and social phenomena reveals a commitment to reductionism. Reductionism means that every phenomena or process can be explained from a lower level phenomenon and that the causally efficacious level is the micro level:

“A reductionist ontology will take for granted that causation travels bottom up, the causally efficacious level is the micro level. This means that it is assumed that it is possible to causally counteract an outcome on a macro level by interfering with a causal process on the micro level ” (1: 8).

A commitment to explore causation on the micro level, works well when the aim is to understand properties or dispositions but as explained before functions cannot be fully comprehensible without analyzing the context it appears in (10).

A well-known idea within holism is that the whole is more than the sum of its parts; this complexity is also described within the view of dispositionalism:

“Dispositionalism acknowledges that all causal powers interact in such a way that all factors compose into what could be called a resultant power of the individual overall. Such composition need not be simply linear. It is not as we can just add powers and get their sum. Most, if not all, causal production seems to happen through nonlinear composition” (1: 9).

Considering the complex heterogeneity of MUS, the fact that similar causes give vastly different effects and the seemingly non – linear causation. Like researchers on MUS we wonder how the biomedical model can address these issues.

The dominant use of RCT and observational data as a basis for evidence based practice advocates a commitment to general facts over particular or singular facts. Individual differences and context sensitivity is ruled out in the favor of being able to conclude with an idealized statistical average situation. This statistical average situation is then considered to be applied any individual case (1):

“The subjective world of human life experience has no given place in a naturalist bio – medical perspective, where objectification and standardization are key concepts. The effects of psychological, relational and socio – cultural aspects on human health have therefore remained systematically marginalized in the knowledge production of this science” (3:598).

According to Eriksen et al (2012) empirical documentation has shown that human experience has a strong biological relevance for developing disease as well as for regaining health. With this knowledge we can argue that it is not justifiable to exclude context and subjective experience from the health care sciences:

“Experience cannot be separated from the subject, and nobody can by definition have an experience on behalf of someone else.

This knowledge indicates that the subject is the key source of knowledge, and that a systematic avoidance of subjective aspects in research on human disease renders the results of this research invalid with regard to treatment of people who are ill” (3: 598).

Horton (1995) states that the work of Canguilhem provides an alternative basis to reductionism. Canguilhem disagreed that a scientific method, claiming objectivity and mathematical certainty is the only model to acquiring knowledge of illness and disease and asked for a descriptive method, where subjective judgement is mandatory:

“.. Canguilhem ask us to examine the contents of a patients experience rather than to begin with a biological translation of that experience” (39:319).

4.0 Discussion

4.1 A new paradigm.

As we have described MUS are common throughout all areas of medicine and can cause disability as severe as those which originate from organic pathology.

The help these patients receive today is not sufficient and research on causality and management following RCT trials has failed to reach a common consensus (ref chapters 4.1, 4.5.1).

The biomedical model tends to ignore that there are many degrees of health/function, labeling patients as being either sick or healthy. Antonovsky emphasize that we will have both healthy and unhealthy components occurring at the same time, moving within a health – disease continuum (ref chapter 3.4.3). We think this distinction is important because it clarifies that the search for pathology is not the only way in battling disease. Ideally health care professionals would be just as concerned about the patient's healthy components, applying an empowering approach that aim to support the patient's inner resources. The wise insight of A.T. Still that the object of the doctor is to seek health seems to be profoundly absent within the biomedical framework (ref chapter 4.4.3).

Both LittleJohn and Canguilhem described the concept of health through the foundational idea of adaptation and we understand this to be consistent with the view on function as a relational concept (ref chapters 4.4.2, 4.5.1).

4.1.1 Reductionism versus the idea of adaptation

Defining health as the ability to adapt takes us back to the reflections on vitality by Littlejohn and the distinction between an organism and a mechanism (ref chapter 3.4.2). An organism can adapt to express a multitude of functions based on the phenomena that dispositions can be combined in a myriad of ways (ref chapter 4.5.1).

On the contrary a mechanism is not in itself able to change, it is created to perform a set function, lacking the intrinsic adaptive quality to respond to a changing environment (ref chapter 4.4.2).

The lack of appreciating that dispositions combine to constitute different functions, depending on what kind of relationship that is formed between them, leads us back to the roots of reductionism. The reductionist view is committed to explore causation at the level of dispositions, taking for granted that causation from the micro level to the macro level. The purely reductionist approach excludes the relational nature of functions by merely focusing on fragmented parts.

We find this problematic because when we define health as the ability to adapt it is implicit that we understand health and function as relational concepts. Reductionism as a strategy works well when applied to understand the workings of mechanisms, however it fails to capture the relational nature of human function (ref chapter 4.5.1).

Littlejohn stressed that the aim of the osteopath is to enable normal physiological relationships and that the idea of adaptation should be seen as the foundation for understanding health and illness (ref chapter 4.4.2). If we consider the relational nature of functions, we can remain open that the causally efficacious level just as well can be at the macro level. In this way we understand the idea of adaptation as an alternative to reductionism.

4.1.2 The importance of context

We know today that human experience has a strong relevancy for the biological understanding of the development of disease, as well as for regaining health (ref 3.5.1). Considering what research can tell us about stress as a global response, allostatic overload, and modulation of the pain experience from higher centers, there is no doubt that our mental and emotional state can directly affect our physiology (ref chapter 4.2.3, 4.3).

In many ways the interdependence of body and mind goes without saying, however the long-held belief in reductionism and dualism reveals that this is not so obvious in our culture

In the introduction we suggested that CLBP can be seen as a state of maladjustment (ref chapter 2.1). In other words we can say that CLBP is a consequence of allostatic load, allostatic load being the opposite of successful adaptation (ref chapter 4.3.1)

As we have described allostasis and allostatic load is the study of how the different systems in the body cooperate to maintain homeostasis in the face of change (ref chapter 4.3.1). The different organ systems are constantly relating, influencing the organism as a whole. Because of this ongoing dialogue between organ systems we won't necessarily get the whole picture by adding the different parts. The missing piece is what Eriksen (2013) describes as the resultant power (ref chapter 4.5.1). Described in other words the sum of the whole is more than just the sum of the parts. Missing this piece, searching for a simple cause – effect linear relationship, has unfortunately compromised the view of the person as a functional unit in health care sciences (ref chapter 2.1).

We know that psychosocial components are the main risk factors predicting chronicity of LBP (ref chapter 4.2.4). Considering what we know about the global effects of stress and allostatic load it is obvious that the external environment can be a major causal factor in developing disease (ref chapter 4.3). As we have described, no part of the body is unaffected by the stress-response (ref chapter 4.3.2). Considering how mental and emotional states affect the endocrinological, neurological, musculoskeletal and immunological systems it is possible to argue that there is no definite boundary between the external and the internal environment.

In this regard we think it is important to stress that causal factors are very seldom either external or internal, there is not a single, simple cause (ref chapter 2.1). The internal and the external environment is intricately intertwined.

The mismatch between objective findings and symptoms when looking for the causes of CLBP reminds us of the thoughts by Canguilhem and Littlejohn. Canguilhem argued that biological findings in themselves are not disease and Littlejohn was against the assumption that the “ideal” body would guarantee perfect health (ref chapters 4.2.3, 4.4.2). This seems to be true when we consider MUS conditions in general and CLBP in particular (ref chapters 4.1.1, 4.2.2)

We know that chronic pain is not the same as nociception, the same input will give a different sensory experience depending on each person (ref chapter 4.2.3). Considering that pain is defined as an unpleasant sensory and emotional experience we can conclude that the experience of pain is a subjective phenomenon calling for an individual approach. By individual approach we mean an approach that is sensitive to context (ref chapter 4.2.1).

An uncritical application of the bio – psychosocial model can lead to an oversimplification of medically unexplained symptoms in clinical practice, what we have described as psychogenic inference (ref chapter 4.1.1). In some cases it may lead to an unreasonable rejection of manual therapy as being passive and deconstructive. This is unfortunate because treatment by manual therapists including osteopathic treatment can be of great benefit for these patients, where the aim of treatment will be to reduce the patient's allostatic load through working with the MINE system (ref chapter 4.2.3). Ideally the osteopath/ manual therapist will be part of a multidisciplinary team including a doctor, a psychologist and a physical therapist.

Many conditions categorized as MUS have strong psychological components; however the patients nevertheless experience their symptoms as physical. Naturally patients tend to demand a physical cause for their symptoms, feeling frustrated when they are told that the results of investigation are negative. In addition patients may fear that they will not be taken seriously if their pain is not proven to be in direct relation with a physical cause. In the most unfortunate situations, to tell the patients that the pain has no physical cause can be interpreted by the patient as if the health care professional is rendering their experience of pain as unreal or insignificant. It is reasonable that patients feel frustration and even despair when they are not given a convincing explanation of why they are suffering. It is an important responsibility for primary health care professionals that patients are educated about the body–mind connection. Discussing psychological factors in an appropriate way can confirm for the patient that the healthcare professional will take their symptoms seriously, whatever the cause of their illness, and that it is likely to be multiple causal factors, both at the micro and macro-level. It can also affirm that we are interested in how the symptoms affect the patient’s sense of agency and their quality of life (ref chapter 4.1.1).

We think that defining health as the ability to function and being an agent is a good choice, because it promotes context sensitivity and acknowledges holistic complexity. With the imperative that function is understood as a relational concept. Function as a relational concept describes how the part relates to the whole. This includes relationships both at the micro and macro-level. As we have repeated it is not possible to fully understand a function by merely focusing on details, we need to analyze the relationships that constitute the function (ref chapter 4.5.1). The emphasis on health as function will give possibilities to offer a healthcare service that is sensitive to context, including both the internal and the external environment.

In our opinion this would be the ideal application of the foundational idea of adaptation because it will put healthcare professionals in a position where it is mandatory to embrace subjectivity. This is not possible within the biomedical framework and the standardized/ generalized natural science (ref chapter 4.5.1).

5.0 Conclusion

The aim of our project has been to clarify why the biomedical approach causes trouble when applied to patients that have no clear pathological lesion explaining their symptoms.

We also wanted to clarify how the foundational idea of adaptation starting with Littlejohn differs from the biomedical approach.

As we explained in the introduction, researchers on MUS call for a new ontological model in healthcare services that can include causal complexity, individual variety and context sensitivity. We have argued that the emphasis on functional relationships derived from the foundational idea of adaptation can be the opposite of reductionism. These relationships are formed in response to context which implies a natural promotion of an individual approach, sensitive to context.

To end our conclusion we would like to look back at the distinction between a mechanism and an organism. When we observe an organism as if it were a mechanism we are bound to end up with a health care system that is essentially mechanistic. However if we put major emphasis on the relational nature of functions, analyzing the many ways we are adapting to the environment, that will open the possibility for a healthcare system that is essentially holistic.

For further study it can be interesting to explore how patients with NSLBP interpret their symptoms, based on their own experience, and compare this with explanations given by osteopaths or other manual therapists. One approach can be to interview the patient and the therapist before and after treatment.

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