

# MIND TO BODY:

## HOW DEPRESSION AND STRESS PRODUCE ILLNESS

by Cecilia Keogh

**K**nowledge of the ways in which depression and stress interact with the physical self to produce illness can add a valuable dimension to the work of counsellors and psychotherapists. Outside our profession, such knowledge could lead to a much needed change in which a holistic view is taken of the patient so that he or she is treated as a person whose emotional life needs to be nurtured as physical conditions are addressed.

In this article I will look at the interaction between depression, stress and physical illness; I will describe the role of the central nervous system; I will briefly mention the nervous system and Borderline Personality Disorder; and I will refer to my own research into nurses' views on the role of counselling in the treatment of patients.

### Role of Depression in illness

That there is a link between depression and physical illness is increasingly accepted.

For instance, research (by Khalil *et al*, 2010) suggests that depressive symptoms are a risk

factor for increased morbidity and mortality in patients with renal (kidney) failure. Their work points out that depressive symptoms have been hypothesized to stimulate cytokine production within the body. Cytokines are proteins secreted by cells of the immune system. The production of cytokines causes inflammation in people with chronic illness.

In the process just described, depression is thought to lead to inflammation. It is particularly interesting to note that this may be a two-way process: not only may depression stimulate inflammation but inflammation may produce depression.

In this regard, Khalil *et al* state that evidence from animal studies demonstrates that when pro-inflammatory mediators (such as cytokines) are present in the central nervous system they can produce behaviour consistent with depressive symptoms. Haemodialysis can, they state, stimulate the inflammatory process so that this link is especially significant for persons who receive haemodialysis.

They cite a 2003 study which demonstrated an association between depression and inflammation in humans. In the study, a serum protein was measured as a marker of inflammation in over six thousand men and it was found that the men with depressive symptoms had over two and a half times higher level of the protein.

A further study by Duarte *et al* (2009), shows that depression has been proven to be an important predictor of morbidity and mortality in renal patients. This is because it is associated with immunological and inflammatory changes which themselves are associated with increased cytokine levels. These inflammatory changes were shown to increase the incidence of infection in patients receiving a particular form of dialysis.

What of the link between depression and heart disease? Doyle *et al* (2007), state that depression following myocardial infarction (heart attack) is reported at twice that of comparable general population samples.

However, there is now an increasing realisation that depression may have been present prior to the cardiac event and that depression may actually be important as a cause and predictor of coronary heart disease. Depression has been associated with reduced pumping ability in the heart muscle. Doyle *et al* cite several studies that show a link between depression and heart disease. They note, however, that relatively little has been done to examine the link between psychological well being and reduced risk of heart disease.

These findings, and especially the finding that depression may contribute to heart disease, add an urgency to the need to treat depression as effectively as possible.

### **Role of Stress in Illness**

The link between stress and illness involves hormones that affect, or are produced by, the central nervous system, specifically the hypothalamic-pituitary-adrenal (HPA) axis; these hormones have potentially both protective and maladaptive consequences. Stressors stimulate the release of a hormone adrenocorticotropic hormone (ACTH) by the hypothalamus and pituitary glands (situated in the brain). ACTH in turn triggers the release of glucocorticoids from the adrenal cortex, which is situated over the kidneys. These glucocorticoids produce many of the effects of the stress response.

The level of circulating glucocorticoids in the blood is the most commonly employed physiological measure of stress. In the short term this stress response helps us adapt to and respond to stressors. However, if maintained over the long term it produces maladaptive changes

such as enlarged adrenal glands, gastric ulcers and increased susceptibility to infection.

The effects of stress are widespread. Research by Ross (1999) found that stress levels influence the autonomic nervous system (a part of our nervous system which operates outside our voluntary control, regulates heart rate and performs other vital functions). This can lead to coronary vessel constriction, tachyarrhythmias (irregular, fast heartbeat), and other adverse cardiac events.

Ross also states that depression has been associated with increased mortality in the general medical population. One reason is that depression has been associated with enhanced platelet aggregation (blood clotting).

### **The Central Nervous System**

The amygdala is an almond shaped set of neurons located in the medial temporal lobe of the brain and forms part of the limbic system. Emotional expression is controlled by the limbic system. The traditional approach in neuroscience to the study of cognition in humans has excluded examining emotion. However recent studies in cognitive neuroscience have highlighted the interaction with human emotions.

According to Phelps (2006), even abstract representations of fear can influence the amygdala which in turn stimulates the physiological response to fear.

Certain stimuli, as is well known, are prone to evoke an emotional reaction, but the way in which these stimuli are processed and interpreted is crucial to the effect on emotion, behaviours and actions. Phelps argues that

through conscious strategies and practice the interpretation of events can be altered and this can in turn alter emotional reactions. Reappraisal is described as seeing the glass half full as opposed to half empty. In other words reappraisal has a great deal in common with the therapeutic practice of reframing.

The change brought about by the cognitive act of reappraisal has been shown to alter the perception of emotion by reducing amygdala activation. This must lead us to the conclusion that conscious reappraisal can influence the emotional response. Thus reframing, if adopted by the client, can have the physical effect of dampening down the emotional response in the brain.

As mentioned the amygdala is critical for the expression of symbolically acquired fears. These are fears that are imagined and anticipated even though the object or event is never actually experienced. Traditionally it was assumed that fears were acquired through a conditioned response as described by behavioural theorists. Phelps argues that humans have developed a more efficient symbolic means of communication which is language. This means that fears can be acquired through indirect means.

She gives the example of someone learning to fear a neighbourhood dog by listening to a discussion about how dangerous the dog is. This type of instructed learning will result in a fear response to the dog even though there is only symbolic knowledge. She goes on to say that the amygdala may be involved in learning to associate stimuli with positive outcomes but concedes that future research will need to explore this theory.

She emphasises that the amygdala is not the only brain structure identified as important for processing emotion and that limits in neuroscience techniques necessitate looking at structures individually rather than how they interact. Overall she concludes that it is increasingly difficult to separate emotion and cognition when processing stimuli. This is very significant in understanding psychological theories particularly cognitive behavioural approaches. It suggests that cognitive retraining can influence our emotional response and this has been verified by these studies of the amygdala.

### **Empathy and Borderline Personality Disorder**

Pinel in the book *Biopsychology* states that the amygdala is believed to be the structure in which the emotional significance of sensory signals is learned and retained (1997, p.448). I would suggest that this adds a physiological aspect to counselling as the changes in perception resulting from talk therapy lead to neurological changes.

In his book *Zero Degrees of Empathy* (2011), Simon Baron-Cohen also emphasizes the role of the amygdala in relation to its role at the "centre of the emotional brain". In a study on empathy, subjects underwent brain scans while looking at pictures of other people's eyes and were asked to make judgements about their emotional and mental state. One brain region clearly activated was the amygdala.

Individuals with BPD were unable to detect accurately the emotions portrayed. An article by Vincent Di Norcia (2011) entitled *Ethics on the Brain* also

emphasises the importance of the amygdala and states that it "helps a person to consciously respond to another's expressions of anger, fear and disgust by linking attention with emotion". This could have enormous implications for working with clients with BPD and could provide increased insight into their condition. It suggests that their neurological make-up is at the source of their condition.

### **Ulcers: an emotional/physical link**

Pinel (1997) describes how the study of stress induced gastric ulcers has focussed on the amygdala because of the key role it plays in response to threat. Electrical stimulation of certain areas of the amygdala increases the flow of hydrochloric acid and decreases blood flow in the gastric mucus (stomach lining). As a result, stimulation of these areas of the amygdala can even after a few hours produce gastric ulcers. Hydrochloric acid is a major constituent of stomach secretions and it has the function of digesting food: it is normally present in concentrations capable of dissolving some metals. This indicates that feelings of stress can have direct physiological implications.

### **Counselling and illness**

That counselling is beneficial for persons suffering from a chronic illness is supported by research, including my own research with nurses. In their research, Kelly and Tibbles (2004) report that eighty four percent of patients found counselling helped them cope better with their situation. Responses in my research indicate that the expressing of feelings and fears may lead to increased acceptance of illness. This in turn appears to lead to empowerment and increased feelings of control.

Sixty six percent of patients in the Kelly and Tibbles survey believed that counselling helped towards being positive about their treatment. Again this was echoed by nurses in my research who reported that support and coping tools led to a more positive attitude and acceptance which can lead to increased compliance with treatment. As one nurse put it, "to have the patient psychologically prepared for what is ahead can be half the battle". Another said, "a chronic illness is for life so acceptance is vital to maintain day to day living."

Another raised the issue of loneliness and suggested that some patients may enjoy hospital admission for company and a break from daily problems. This was echoed by another who proposed that group therapy in the community would cut costs as patients could be cared for at home.

Sadly, though most respondents considered that counselling would be cost effective, most doubted if funding would be provided.

Yet the benefits for some patients could be profound. Research (for instance by Duarte, Miyazaki, Blay et al, 2009) proposes that depression leads to immunological changes, development of infections, increased hospitalizations and decision to withdraw from dialysis. Other researchers have found that depression increases medical costs for renal patients (Katon and Ciechanowski 2002) arising from primary care visits, specialised consultant visits, laboratory test and inpatient costs. These findings point to counselling providing both a preventative and health promotion role in illness.

One respondent considered that counselling intervention would be most beneficial when a patient is first diagnosed. She proposes that many complications could be prevented if acceptance of the condition was facilitated soon after diagnosis. Indeed, research by Guthrie (1996) found that well-timed psychological interventions during the initial state of an illness may have a protective effect against the subsequent development of psychological disorder.

### The issue of lack of counselling

I found it worrying that people with quite traumatic symptoms were not always in a position to avail of psychological help. For instance, patients who have chronic obstructive pulmonary disease need support as this can cause extreme breathlessness which is both anxiety provoking and frightening. Fifty percent of nurses in my research cited this condition as being particularly suitable for counselling intervention. It seems unacceptable that patients who have conditions that lead to physical changes such as amputation and colostomy formation on general hospital wards are not routinely offered support. One respondent who worked in a burns unit reported that patients were offered a psychiatric referral only if the burns were self inflicted. These are, as noted by respondents, life changing events but no routine opportunity to process them is offered.

### Conclusion

Counselling and psychotherapy will need to be accepted by the medical community as an adjunct to medical treatment before it will be routinely offered to patients. Further research

which provides a more complete picture of the benefits is necessary. It may not be until research includes brain scans before and after psychological support that doctors will consider it routinely.

Empirically validated research that links physiology, emotions and cognition is the way forward. However, this would be prohibitively expensive at the present time. Also neuroscience is still in its infancy and much more knowledge needs to be gained in this field in order that results obtained can be accurately assessed.

Ultimately, what is needed is a change of perspective in which the person could be viewed holistically within a health care setting rather than the emphasis being on the symptoms and medication involved in their care.

Such a change will allow the individual to feel validated and understood thus leading to greater self care and perhaps less medical intervention. As counsellors and psychotherapists we have a key role to play in this development. 



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