

PHYSIOLOGICAL UNDERSTANDING OF KRODHA (ANGER) - A REVIEW ARTICLE

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ABSTRACT

Anger is an intense emotional response. It can occur when a person feels their personal boundaries are being or going to be violated. Anger could be start of something deeper like rage or violent action and reactions. According to *Ayurveda*, *Rajo guna* is predominant in *krodha* (anger). In *Charaka Samhitha*, *Krodha* is mentioned under *Dharaneeya vega*. *Krodha* can be inferred one of the *mano vikaras*, also associated with *Sharirikdoshas-pitta*. It is one of the *Pitta vrudhi lakshana*. *Krodha* is directly effect to *Manovishayas* that in turn to hamper *Jnanotpatti*. The anger is best recognized and best controlled if it is more understood. It is important to recognize the physiological effects of anger especially with all the damage this emotion might produce to our body system. This review article examines the physiology, causes of anger, and impact of anger on the body.

Keywords: Anger, *Krodha*

INTRODUCTION

Anger is the emotional response that we have to an external or internal event perceived as a threat, a violation or an injustice. It has been widely theorized that anger is an adaptive response and is a version of the fight or flight response, which in turn is believed to have evolutionary usefulness in protecting us from danger.

Ayurveda as well as Indian philosophy has explained anger as a *Dharaneeyavega*¹ (suppressible urge) and its importance. To control anger is very essential to prevent psychosomatic diseases. Anger will also activate emotional impacts on the different body system, such as alteration in physiological conditions, like increased heart rate, elevated blood pressure, and increased level of adrenaline and noradrenalin due to

sympathetic discharge. Anger as an emotion which triggers part of the fight or flight response²

It is important to recognize the physiological effects of anger especially with all the damage this emotion can cause to our body. It is also important to learn how to express anger appropriately.

MATERIALS AND METHODS

Data have been collected from the *Ayurvedic* classics, i.e. *Brihatrayee* and other classics with the available commentaries, as well as various reference books to be reviewed.

REVIEW OF LITERATURE

*Krodha*³ means anger. According to *Ayurveda*, *Krodha* is *Rajoguna Pradhana*. *Acharya Charaka* mentioned in *vimana sthana*, *Krodha* can be inferred

by tending to take revenge. *Charaka suthra sthana* explained *krodha* under *Dharaneeyavega* (suppressible urge). *Lobha* (avarice) *Shoka* (grieve), *Bhaya* (fear), *Krodha* (anger), *Mana* (pride), *Nirlajja*, *Irsya* (jealousy), *Atiraga*.

Krodha is the *Hetu* for vitiation of *Sharirikdoshas*, and is a cause for diseases like *Jvara* (fever), *Atisasara* (diarrhea), *Shosha* (emaciation), *Meha* (diabetes) *Paitika gulma*⁴, *Arocaka*⁵, *Rajaykshma*⁶, *Unmada*⁷, *Apasmara*⁸, *Pratisyaya*⁹, *Trishna*¹⁰, and *Vatarakta*¹¹ etc.

The *Jnanotpati* take place when the combination of *Atma*, *Indriya*, *Manas*, *Indriyartah* takes place. Here *Manas* is also the one of the factors for gaining and interpretation of knowledge. *Krodha* also one among the *Manovikaras*, which directly affect the *Manovishayas*¹² which are *Cinta*, *Vicara*, *Uhya*, *Sankalpa*. That is nothing but the decision making capacity of the individuals will alter.

CAUSES OF ANGER

Pain; Frustration; Irritation; Tiredness; Hunger; Puberty; Hormonal changes; Use of certain drugs; Grief; Rudeness; Fatigue; Physical illness; Mental illness; Sexual Frustration; Injustice etc.

PHYSIOLOGY OF ANGER

Anger is experienced in our bodies as well as in our mind. When we are in angry, series of physiological events can occurs.

Physiology of anger is connected to

- Amygdala/ Limbic system
- Hypothalamus
- Pituitary gland
- Adrenal gland

The amygdala is the part of the brain, responsible for identifying threats to our well-being, and for sending out an alarm when threats are identified. If the incoming data is enough to trigger an emotional charge, the *amygdala* can override the cortex, which means the data will be sent to the limbic system. This reactive incident is known as an amygdala hijacking.

When the amygdala is hijacked, a flood of hormones like adrenalin or noradrenaline are released that can cause physical and emotional alarm. Due to the impact of this hormonal flush the person is usually out of

control. Impact can last for several hours to days. Stress hormones are active for about 4 hours which is known as amygdala hijack hangover.

The first spark of anger activates the amygdala. The amygdala activates the hypothalamus. The hypothalamus signals the pituitary gland by discharging corticotropin releasing hormone (CRH). Brain releases neurotransmitter catecholamines. Then the pituitary activates the adrenal gland by releasing adrenocorticotropin hormone (ACTH). The adrenal glands secrete stress hormones like cortisol, adrenaline, and noradrenaline.

- During anger body muscles tense up.
- Heart rate accelerates
- Blood pressure rises
- Rate of breathing increases
- Increase blood flow enters in to the limbs.
- Attention narrows and becomes locked onto the target.

CONTROL OF ANGER

The prefrontal cortex of brain, keep emotions in proportion. If the amygdala handles emotion, the prefrontal cortex handles judgment. The left prefrontal cortex can switch off emotions.

The sympathetic nervous system floods the body with stress hormones - primarily adrenaline and noradrenaline, which cause arousal. The parasympathetic nervous system counters this arousal by releasing another hormone, acetylcholine which neutralizes the stress hormones and allows the body to calm down and relax.

SYMPTOMS¹³

- High blood pressure; Shortness of breath; Heart palpitation; Exaggerated body movement; Dilated pupils; Sleeplessness; Increased swearing; Irritation; Tense muscles; Constipation; Stiffness of posture; Trembling; Speech and motion are faster; Increased physical strength; Anxiety.

EFFECT OF ANGER ON BODY

ANGER ON BRAIN

Elevated cortisol causes neurons to accept too much calcium through their membrane. A calcium overload can make cell fire too frequently and die.

The hippocampus and prefrontal cortex are particularly vulnerable to cortisol and these negative effects.

A). PREFRONTAL CORTEX

Elevated cortisol causes a loss of neurons in the prefrontal cortex. Suppressed activity in the prefrontal cortex alter the decision making capacity and planning for the future.

B). HIPPOCAMPUS

Elevated cortisol kills neurons in the hippocampus and disrupts the creation of new ones. Suppressed activity in the hippocampus weakens short-term memory. Hormone serotonin is considered as happy hormone. Too much cortisol will decrease serotonin level. A decreased serotonin can make feel anger and pain more easily. Increase aggressive behavior and lead to depression.

ANGER ON CARDIOVASCULAR SYSTEM

- Heart rate increase
- Blood pressure increase
- Arterial tension increase
- Blood glucose level increase
- Blood fatty acid level increase
- Blood vessels clogged and damaged. This can leads to hypertension, stroke and heart attack.

ANGER ON IMMUNE SYSTEM

- Thyroid function decreases
- The number of natural killer cells decreases
- More prone to get infection
- Incidence of cancer increases

ANGER ON DIGESTIVE SYSTEM

- Blood flow decrease
- Metabolism decrease
- Dryness of mouth increase
- Reabsorption of calcium is more from the bone so bone density also decreases.

MANAGEMENT

For management of *krodha*, three steps are available. Prevent, prepare and practice, In that understanding of anger is important, know our triggers. Then prepare our body and mind, to control *krodha*, meditation and yoga are more useful. According to *Caraka* the *vayu* can control the *manas*¹⁴. That's why *pranayama* keeps body in to calm and quit. Treatment like *siro dhara*, *picu*, *thalam*, etc are more helpful.

DISCUSSION

Thousands of year before our acharyas explained *krodha* directly affects our body as well as mind. If it is not controlled properly it may become *nidana* for certain diseases. So before pathological understanding physiological understanding is more important.

Anger is one of the basic human emotions, just like happiness, sadness, anxiety, or disgust. Anger is related to the "fight, flight, or freeze" response of the sympathetic nervous system which prepares humans to fight.

According to *Ayurveda* the combination of *Atma*, *Indriya*, *Manas*, and *Indriyartas* leads to *jnanotpatti*. Here *Manas* is the one among factors for gaining the knowledge. As mentioned earlier *Krodha* is the one of the *Manovikaras* that directly affects the *Manovishayas*. Also acharyas have explained about the *heenayoga atiyoga* and *mithya yoga* which causes *asatmendriyarthas sannikarsha* and *prajnjaaparaadha* as the root cause of *krodha*

Same thing is explained by modern physiology also. Due to anger there will be production of certain hormones and neurotransmitter, which in turn activate HPA axis. From brain due to excessive calcium overload neuron death occurs that suppressed activity in the prefrontal cortex. Suppressed activity in the hippocampus weakens short-term memory.

And this prolonged release of the stress hormones can destroy areas of the brain associated with judgment and memory and weakens the immune system which in turn causes nothing but poor decision making capacity of the person. Blood vessels gets damaged which leads to hypertension, stroke and heart attack. Reabsorption of calcium is more from the bone so bone density also decreases.

So like all the emotions, anger should also be managed before u do things that harm people around you for which u may regret in the future, which paves way for further discussions on different approaches of *ayurveda*, on the *manovikaras*, like the *satvavajaya chikitsa* along with perspectives like importance of *sathvritha* and *aachaara rasayana* in maintaining the wellbeing of a person which are being ignored nowadays.

CONCLUSION

According to Ayurveda, *Krodha* means anger. *Krodha* is also one among the *Manovikaras*, these directly effect to *Manovishayas*. Modern physiology also mentioned the bad effect of anger on body. Such as impaired decision, incidence of heart attack, reduced bone density etc. *Vata* can control the *Manas*, so controlling of *Vata* is important for the anger management.

Anybody can become angry - that is easy, but to be angry with the right person and to the right degree and at the right time and for the right purpose, and in the right way - that is not within everybody's power and is not easy. So understand the causative factor and control the anger.

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