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OXYTOCIN – more than a hormone of mechanics.

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Oxytocin – the hormone of birth and lactation mechanics

- Discovered in 1906 by Sir Henry Dale.
- Substance found in the pituitary gland that sped up the course of labour.
- He called it “oxytocin” from the Greek “quick birth”.
- Later discovered it caused the milk letdown reflex.

(Uvnas Moberg 2003)

- Until very recently most standard midwifery and obstetric textbooks focus on the role of oxytocin in the **mechanical** processes of birth. (Romano and Lothian 2008)

New discoveries

- However new discoveries about the nature of physiology and the role of oxytocin dispels the misleading concept of oxytocin as a merely a mechanical hormone.
- Is this message getting out? – particularly to those providing maternity care.

The nature of physiology

- "The science of physiology describes how an individual works within the body and in relationship with the environment." (Schmid and Down 2010).

- The endocrine system and the nervous system used to be thought of as separate systems but have been found to be closely integrated to "co-ordinate, regulate and adjust the internal physiology in response to changes in the external environment." (Coad and Dunstall 2005)

What is oxytocin?

- Peptide neurohormone comprised of 9 amino acids.
- Found unchanged in all species of mammals.
- Found in males and females.
- Produced in **hypothalamus.**
- Transported to pituitary gland via large nerve cells for release into the blood stream as a **hormone – systemic response.**
- Transported to other parts of the brain by small nerve cells as a **neurotransmitter – emotional and behavioural response.**

(Uvnas Moberg 2003)

- **Dual release ensures the systemic effects are co-ordinated with the emotional and behavioural effects. (Buckley 2010)**

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Effects of oxytocin.

- Systemic responses
- Causes smooth muscle to contract thus causing ejection reflexes
  - sperm ejection – male orgasm
  - sperm introjection – female orgasm
  - Fetus ejection
  - Placenta ejection
  - Milk ejection

(Buckley 2010)

Emotional and behavioural responses.

Love, pleasure, sexual activity.

Social behaviour and bonding.

Relaxation

Maternal and infant bonding and attachment

Breastfeeding

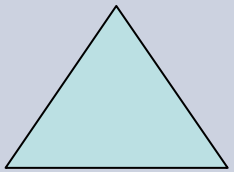
Maternal behaviour - nesting, grooming, aggressive protective behaviour.

(Uvnas Moberg 2003; Buckley 2010)

Mammalian birth

- The dual responses of oxytocin are designed for species survival and reproductive success for subsequent generations.
- Triangle of survival (Buckley 2010)

Birth



Attachment Breastfeeding

Oxytocin - modulator of “calm and connection”

- Emotional states are triggered by and trigger the production of hormones which transform those states into physiological reactions of the sympathetic nervous system or the parasympathetic nervous system. (Schmid and Downe 2010)
- “Flight or fight” – governed by sympathetic nervous system – modulated by stress hormones. (Uvnas Moberg 2003)
- “Calm and connection” – governed by parasympathetic nervous system – modulated by **oxytocin.** (Uvnas Moberg 2003)

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Opposing physiological systems

(Adapted from Uvnas Moberg 2003).

- Fight or flight (stress hormones)

Stimuli

- Pain
- Cold
- Hunger
- Danger
- Challenge

- Calm and connection (oxytocin)

Stimuli

- Touch
- Warmth
- Fullness
- Sexual activity
- Social interaction
- Security

- **Fight or flight**
- Behavioural reaction
- Tense
- Alert
- Self-possessed
- Performance orientated
- Competitive
- Strong and enduring
- Controlling
- Independent
- Energy burning

- **Calm and connection.**
- Behavioural reaction
- Relaxed
- Contemplative
- Happy
- Companionable
- Placid
- Sensitive
- Emotional
- Dependent
- Growing and healing.

- **Fight or flight**
- Physiological response
- Increased heart rate and pumping volume
- Elevated blood pressure
- Increased blood circulation to the muscle and essential organs
- Extra fuel from release of glucose from the liver.
- High levels of stress hormones.

- **Calm and connection**
- Physiological response
- Lowered blood pressure and heart rate
- Increased circulation in the skin and mucous membranes
- Lowered levels of stress hormones
- More effective digestion, nutritional uptake and storage.

Application for normal birth.

- “Calm and connection” system needs to be dominant.
- Need to create a oxytocin – friendly environment to ensure optimal hormonal reactions.
- Birth needs to be –
  - Undisturbed
  - Private
  - Physically and psychologically safe (Buckley 2009)

Interference with the oxytocin system- the consequences!

- Birth
- Attachment
- Breastfeeding
- Baby's oxytocin system – genetic imprinting and epigentics.
- Malfunctions associated with oxytocin include
  - Autism, schizophrenia, depression, cardiovascular disease, drug and alcohol abuse, antisocial behaviour.

Buckley 2009, Odent 1999

Odent (1999) hypothesises that society's deficits in its capacity to love self and others may be traced back to birth, especially interference with the oxytocin system.

Conclusion

- Oxytocin is far more than a hormone of mechanics.
- Dual role of oxytocin is highly significant for reproductive success and species survival of mammals.
- Human mammals ignore this to their peril.
- The key to promoting normal birth is to create an environment in which the “calm and connection” system can be dominant – this means privacy, sense of subjective safety and being undisturbed.

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