
Extended Abstract

The hypophyseal microvasculature portal system located at the base of the brain connects the hypothalamus arcuate nucleus and anterior pituitary gland for rapid and undiluted transport of the neurohormones vital for infertility prevention

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ABSTRACT

The Enteric Nervous System (ENS) includes the gut microbiota diversification interacting with the epithelial and immune cells of intestinal stomach, small and large intestine, and colon. The ENS controls motility, fluid acid / base homeostasis, and blood flow inside the gastrointestinal tract postnatally for ENS maturation.

The vagus nerve is the modulator of the parasympathetic nervous

system that uses a bidirectional communication system with the paravertebral ganglia. Nutrients including vitamins, minerals, neurotransmitters, peptides, and hormones travel through ENS via the vagus nerve in the blood up the spine crossing the blood brain barrier to connect sensory, mood, appetite, sleep and cognitive regulation and function. Nervous system essential vitamins are B group (1, 3, 5, 6, 9, 12), C, zinc, magnesium L threonate, vitamin D, omega three fatty acids, L -thearine amino acid, l-methyl folate, S-Adenosylmethionine (SAM-e), and 5 HTP serotonin and dopamine.

Key Words: Ghrelin; Peptides; Adrenocorticotrophic hormone

INTRODUCTION

The vagus nerve is the 10th cranial nerve. The longest nerve starting from the brainstem down the neck, thorax, and into the abdomen. 90% of the vagus nerve consists of afferent nerve fibers regulating inflammatory processes, hunger, fullness, and energy metabolism. The other 10% are efferent nerve fibers that secrete gastric acid and digestive enzymes and control gastric emptying of the stomach contents. The most important function of the afferent vagal nerve is bringing information from the gut, liver, heart, lungs to the brain.

The second most important function of the vagal nerve is to connect the peripheral intestinal functions such as the immune activation, intestinal permeability, enteric reflex, and enteroendocrine signaling. This requires the brain-gut brain axis (brain, spinal cord, and autonomic nervous system comprised of the sympathetic, parasympathetic, and enteric nervous systems that communicate with the vagal afferent pathways in activation and regulation of the

Hypothalamic-Pituitary-Adrenal (HPA) axis. The vagal efferent send down signals from the brain to the gut to respond to sensory data-sight, sound, touch, taste, or perceive danger.

When the amygdala perceives danger, the hypothalamus secretes Corticotropin Releasing Factor (CRF) which stimulates Adrenocorticotrophic Hormone (ACTH) from the pituitary gland which releases cortisol that affects the brain, bones, muscles, and body fat through intestinal effector cells like immune cells, epithelial cells, enteric neurons, smooth muscle cells, interstitial cells of Cajal and enterochromaffin cells which are regulated by the gut microbiota. Peptides CCK Cholecystokinin, ghrelin, and leptin are sensitive to the nutrients in the gut and short-term feelings of hunger and fullness. The vagal afferent fibers innervating the gut. Protein digestion into long chain fatty acids, omega three fatty acids, amino acids, and small peptides release CCK stimulation secretion of the pancreatic fluid, gastric acid, contracting gallbladder, decreasing gastric emptying, and facilitating digestion in small intestine.

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Ghrelin is a stomach hormone that enters the blood supply of the stomach to stimulate food intake and release of growth hormone. Ghrelin is increased by fasting and falls after a meal.

Leptin receptors are in the vagal nerve and interact with leptin and CCK to induce short-term satiety and long-term weight reduction. While these processes work in the background, during the everyday lifestyle of the reproductive female, the hypothalamus, pituitary, microvasculature hypophyseal, ovaries, tubes and uterus manage E2, FSH, LH, GnRH pulses and prepare the endometrial microbiota for an embryo to implant preventing infertility. This abstract prepares you to understand the vital importance of the endometrial microbiota in infertility.

Importance of research

Medication protocols to produce dominant follicle readiness as well as successful ovulation can be confirmed with ultrasonography as well as endometrial thickness for implantation readiness. The HPA axis, neuroendocrine hormones, peptides, neurotransmitters, ENS microbiome, vaginal, and uterine microbiome need assessed for homeostasis in cases of infertility where implantation is the critical factor. Gut dysbiosis, endometrial inflammation, and vaginally unstable homeostasis are the key factors preventing embryo implantation. There are laboratory companies offering specialized tests to assess these key factors which would have a significant impact on the decision between IVF treatment, surrogacy or adoption. All which cost thousands of dollars. Identifying the underlying cause of fertility due of embryo implantation factors would give the childbearing female the best choice for the optimal goal of a healthy baby.

BIOGRAPHY

Kelli Kemenah Mauric WHNP-BC, APRN, MS, BSN is the owner of Balance the Brain Professional Corporation. She founded her company to educate her patients on their bodies. Kelli believes that every girl should grow up learning about her human body starting with her basic reaction to a perceived threat, otherwise known as the human survival system or fight, flight, freeze, and fawn responses. The complete nervous system and its interaction with the neuropsychiatric, gut-brain axis, HPA axis, neuroendocrine bidirectional pathways, and the vagal nerve modulator system.

Kelli believes it is a basic human right to be educated about your individual body, the body's automatic responses to its environment, and your right to make all decisions regarding your body.

Education

Kelli is a graduate of The Ohio State University earning both her Women's Health Nurse Practitioner education and Master of Science degree. She is an alumnus of Lourdes University with a Bachelor of Science in Nursing. Kelli is licensed as an Advanced Practice Registered Nurse WHNP-BC. Kelli is certified through the American Society for Reproductive Medicine as a Reproductive Endocrinology Infertility Nurse.

Awards & Honors

- The Presidential Academic Fitness Award
- Lourdes University Academic Scholarship
- The Bellevue Hospital
- (\$50K Loan Forgiveness for OSU WHNP & MS)
- Promedica Fremont Memorial Hospital
- (Philanthropy Patient Award)
- Lourdes University Honor Society in Nursing
- Sigma Theta Tau National Honor Society

Memberships

- International Society for Female Professional
- American Academy of Nurse Practitioner
- Utah Women & Leadership Project Group
- North American Menopause Society