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Endocrine Fluidity

ABSTRACT

This communication describes the concept of endocrine fluidity, defining it as the phenomenon of changing endocrine and metabolic function, in health and/or in disease, over time. Awareness of physiological endocrine fluidity helps avoid overdiagnosis and unnecessary investigations. Knowledge of endocrine fluidity in pathological conditions allows the astute physician to keep a high index of clinical suspicion for relevant diseases. The concept of endocrine fluidity can be used to anticipate, and address changes in the clinical course of a disease, and to allow for possible deviations from the expected natural trajectory.

Keywords: Circadian rhythm, cyclicity, endocrinology, hormones, physiology

The word fluidity is a noun, which describes the physical property of a substance that enables it to flow. Fluidity has been used to describe not only physical substances like liquids, but also intelligence, cognition, movements and business transactions.[1] In medicine, fluidity is used in the context of anatomy (membrane fluidity) as well as physiology (gender fluidity). We use this word to create a construct, endocrine fluidity, which encompasses both physiological and pathological aspects of hormonal action.

PHYSIOLOGICAL FLUIDITY

Circadian rhythms, or physical, mental, behavioral and hormonal changes that follow a 24-hour cycle, are well known to science. Most circadian rhythms are controlled from the suprachiasmatic nucleus of the hypothalamus, which operates various feedback mechanisms. The Nobel Prize 2017 was awarded to Hall, Rosbash and Young for isolating the gene which controls the biological clock.[2]

Other rhythms have also been described, including ultradian (less than 24-hour cycle), circasemidian (12-hour cycle) and infradian (longer than 24-hour cycle).[3] These can be considered a form of endocrine fluidity. Table 1 lists some physiological examples of endocrine fluidity. The changes in the hypothalamic-pituitary-gonadal axis that govern the monthly rhythm of ovarian physiology in menstruating women may also be viewed as a form of endocrine fluidity.

Another example of fluidity is gender fluidity.[4] Though not related directly to hormonal levels, gender fluidity or change in perceived gender, can be considered a physiological form of life.

PATHOLOGICAL FLUIDITY

Endocrine fluidity can be noticed in endocrine pathology as well. Cyclic Cushing's syndrome, pulsatile prolactin secretion from pituitary adenomas and cyclic pheochromocytoma are examples of this. Hashitoxicosis represents another form of endocrine fluidity, albeit over a longer time frame.

Type 1.5 diabetes, both LADA (late-onset autoimmune diabetes of adult) and Flatbush diabetes (ketosis prone type 2 diabetes) represent forms of metabolic fluidity. Changes in insulin requirement in persons with diabetes, which are so familiar to endocrinologists are the clinical presentations of this fluidity. Another manifestation is the change in diagnostic label that is not so uncommon

Table 1. Endocrine Fluidity

Physiological

- Circadian, ultradian, infradian rhythms
- Changes in pituitary, thyroid, breast size during puberty, pregnancy, lactation
- Gender fluidity

Pathological

- Cyclic Cushing's
- Pheochromocytoma crisis
- Adrenal crisis
- Hashitoxicosis
- Functional testosterone deficiency
- Weight cycling
- Triphasic response after pituitary surgery
- Type 1.5 diabetes
  - Flatbush
  - LADA

Physician-centered

- Changes in guidelines based on current evidence
- Changes in therapeutic targets/strategies/tools based upon change of
  - Age
  - Natal status
  - Comorbid status

in endocrine clinics. Diabetes, metabolic bone disease and gonadal disease often change their presentation, and this fluidity reflects as a change in diagnosis.

PHYSICIAN-CENTERED FLUIDITY

Yet another form of endocrine fluidity is created by endocrinologists themselves. Therapeutic targets, therapeutic strategies and pharmacological tools change with advances in research.[5] This leads to frequent changes in the information and advice that physicians share with their patients. From a patient perspective, this can be construed as a form of medical fluidity, and specifically as endocrine fluidity. While part of this fluidity can be explained by advances in science, some are due to changes phases of life. The targets for glucose, blood pressure, lipid and thyroid health, for example, vary according to age group, natal status and comorbidities.

SUMMARY

Endocrine fluidity is an easily observed phenomenon, both in physiology and disease. Awareness about the condition will help physicians offer counseling and reassurance to those with physiological variants of fluidity, and prescribe appropriate diagnostic and therapeutic interventions for those who need them.

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Surgical Masks are Equally Effective in Providing Protection against COVID as N95

According to a study published in the journal *Annals of Internal Medicine*, surgical masks were found to be as effective as N95 masks in preventing the spread of COVID-19 among health care providers at hospitals. In the study, researchers at McMaster University in Canada tracked 1,009 health care workers at 29 sites in Canada, Egypt, Israel and Pakistan. The author of the study noted that there were conflicting recommendations on the use of N95 masks during the pandemic. The US CDC recommended N95s for routine care of patients with COVID-19, while the WHO and CPHA recommended either surgical masks or N95 respirators. However, several low- and middle-income countries are still struggling to procure N95 masks due to their high cost. Hence, they designed this study to compare the effectiveness of both masks against viral respiratory infection or clinical respiratory illness. The study is a systematic review of 4 RCTs on masks conducted between 1990 and March 2020. The findings of the study showed that the use of surgical masks did not increase viral respiratory infections or clinical respiratory illness. (*Source: https://www.daijiworld.com/news/newsDisplay?newsID=1024802*)