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Anatomical & Physiological Perspective of Effects of Dushi Visha in Pediatrics w.s.r. to Ultra-Processed Food (UPF)

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ABSTRACT

Ayurveda places utmost importance on child health and well being which is evident in garbhini parichaya and shishu paricharya. As pregnancy, lactation and childhood are critical periods for growth, biological development and the establishment of eating behaviours, in addition to being a window of opportunity for health promotion and disease prevention. But in recent years, paediatric dietary patterns have shifted dramatically towards ultra-processed foods (UPFs) high in sugars, additives, and unhealthy fats. Ayurveda categorizes subtle, non-lethal toxins that accumulate in the body causing chronic, hard-to-cure diseases under favourable conditions over time as Dushi Visha.

The body of the paediatric patient is not simply a smaller version of adult counterpart; child physiology and anatomy significantly differ from that of an adult. A basic understanding of these physiologic and anatomic differences is necessary to understand the effects of UPF as dushi visha in children. This paper explores the anatomical and physiological perspective of effect of UPF w.s.r. to dushi visha in paediatrics.

Aims and objectives- To explore the anatomical and physiological perspective of effect of UPF in paediatrics w.s.r to dushi visha

Materials and methods - For the present review work, different editions of Ayurveda classical books, along with Sanskrit and Hindi commentaries, revised Ayurveda books, Pediatric Anatomy & physiology books, journals, articles, web materials.

Conclusion- The child physiology and anatomy significantly differ from that of an adult which makes children more vulnerable to toxins. The approach to dushi visha Chikitsa, garbhini & shishu paricharya dinacharya, ritucharya can prove helpful in preventing it.

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INTRODUCTION

Ayurveda places utmost importance on child health and wellbeing which is evident in garbhini parichaya and shishu paricharya. But in recent years, paediatric dietary patterns have shifted dramatically towards ultra-processed foods (UPFs) high in sugars, additives, and unhealthy fats. Ayurveda categorizes subtle, non-lethal toxins that accumulate in the body causing chronic, hard-to-cure diseases under favourable conditions over time as Dushi Visha. Dushi Visha in defined as a type of toxin that loses its acute potency but persists in the body, becoming active under specific conditions such as seasonal change, poor diet, or stress. Dushi Visha is difficult to diagnose, accumulates in Srotas, and may lead to Manda Vyadhi.

Children today are increasingly exposed to ultra-processed foods such as chips, carbonated drinks, chocolates, packaged snacks, and frozen meals. These foods are often nutrient-poor and chemical-rich, containing preservatives, emulsifiers, artificial colors, and flavor enhancers. A meta-analysis of prospective studies and observational studies demonstrated that intake of UPF was associated with depression and anxiety symptoms. In pediatrics, where dhatu poshana and Agnibala are immature, the risk posed by these latent toxins is significantly higher.

Dushi visha

Acharya mentions Dushi visha is a transformational state of visha, not a type of visha. It is alpa virya, Kaphaavruta, Old & attenuated by vishaghna dravyas, fire, wind, sun and so. Due to apaki quality of visha, it neither gets digested nor eliminated.[1,2]

It mainly gets aggravated by dushita desha, sheeta kala, ahita aahara and diwaswapna.

These hetus will lead to agnimandya and eventually leading to ama Utpatti. It causes srotorodha and dhatu dushti i.e. kapha- meda vridhhi. It mainly causes the oja kshaya.

Clinical manifestations –

The purvaruapas are Guruta, nidra, Vijrumbha, sandhi shaitilya, roma harsha and angamarda. The rupas are atisara- bhinnavarna purisha, vigandha, mukha vairasya, pippasa, murcha, vamana, aspashta bhasa, sannipata udara[1,2]

Ultra-Processed Foods

The NOVA system is a valuable tool for understanding the impact of food processing on diet quality and public health, particularly in identifying the potential risks associated with ultra-processed foods. [6]

UPFs are a category of food that undergo a series of industrial processes like extrusion and moulding, and have presence of classes of additives whose function is to make the final product palatable or more appealing, such as flavours, flavour enhancers, colours, emulsifiers, thickeners, sweeteners, etc.

These toxins are slow acting poison which don't get completely eliminated from the body. Hence remains inside the tissues and impairs the natural cellular functions. Bioaccumulation of such toxins will bring several topical and systemic illness.[4]

Anatomical & physiological perspective

Pediatric anatomy is marked by ongoing structural and functional immaturity that influences responses to dietary exposures. Children exhibit underdeveloped hepatic detoxification pathways, limiting efficient metabolism and elimination of toxins. Increased blood–brain barrier permeability permits greater entry of circulating toxins into the central nervous system, while rapid neuronal growth and synaptic development create critical windows of vulnerability.[3]

Gut microbiota is a complex community of microorganisms which resides in the human intestinal tract. It plays a significant role in many aspects of host physiology, including food digestion, metabolism and immunological regulation.[7]

The intestinal microbiota in children is immature and dynamic. Early dietary habits significantly influence microbial diversity. Healthy microbiota supports immune maturation, gut barrier integrity, and cognitive development. Frequent intake of incompatible or ultra-processed foods leads to dysbiosis, predisposing children to allergies, recurrent infections, obesity, and behavioral disturbances. UPF could alter the composition & metabolism of gut microbiota, leading to metabolic disturbances and inflammatory responses, which increase the risk of metabolic syndrome, CVD, brain disorders and so on.[7]

Discussion

Understanding the anatomical and physiological differences between pediatric and adult populations is essential for ensuring patient safety and effective clinical care. Children represent a unique developmental phase characterized by structural, metabolic, immunological, and psychological immaturity, which significantly alters their response to dietary exposures. These vulnerabilities make children particularly susceptible to the harmful effects of ultra-processed foods (UPFs), which may function as chronic low-grade toxins comparable to Dūṣī Viṣa described in Ayurveda.

From the Ayurvedic Rachana–Kriyā perspective, childhood is marked by Aṅga–Pratyanga Asampūrṇatā and Dhātu Apakva Avasthā, indicating incomplete development of organs and tissues. The pediatric period is Kapha-pradhāna, favoring growth and anabolism; however, consumption of guru, ahita, and asātmya āhāra such as UPFs aggravates Kapha and weakens Agni. Physiological Agnimāndya limits efficient digestion and detoxification, promoting accumulation of metabolic residues. Although children possess Sahaja Bala, this innate strength is developmental and does not adequately protect against chronic dietary insults. Furthermore, Mānasika Asamarthya predisposes children to psychological and behavioral disturbances when exposed to neuroactive dietary components.

Contemporary biomedical evidence supports these classical concepts. Children exhibit immature hepatic detoxification pathways, increased blood–brain barrier permeability, and rapid neuronal development, all of which heighten sensitivity to dietary toxins. Exposure to food additives, artificial dyes, and excess sugars during critical developmental windows may disrupt neurodevelopment and immune regulation.

Clinically, children demonstrate a faster onset of functional disorders such as allergies, behavioral issues, and developmental delays, whereas adults typically show a gradual progression toward metabolic diseases. These pediatric manifestations closely resemble the classical lakṣaṇas of Dūṣī Viṣa,

characterized by chronicity, subtle accumulation, and multisystem involvement.

Thus, integrating Ayurvedic principles with modern pediatric physiology strongly suggests that ultra-processed foods may be regarded as a contemporary form of Dūṣī Viṣa, particularly in children. This understanding highlights the importance of early dietary regulation and preventive strategies during childhood to safeguard long-term health.

Conclusion

Children's anatomical and physiological immaturity makes them uniquely susceptible to the harmful effects of ultra-processed foods. Early dietary exposure may disrupt gut integrity, neurodevelopment, and metabolic regulation, laying the foundation for chronic disease later in life. From an Ayurvedic perspective, these effects closely resemble *Dūṣī Viṣa*, resulting from weak *Agni* and immature *Dhātu*. Ultra-processed foods, being *guru*, *ahita*, and *asātmya*, further aggravate this vulnerability. Preventive strategies rooted in *Agni* preservation, *Āma* prevention, and *Garbhini* and *Śiśu Paricharyā* offer a comprehensive framework to safeguard pediatric health in the modern dietary environment.

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