Current Medicine Research and Practice 9 (2019) 203–204

Contents lists available at ScienceDirect

Current Medicine Research and Practice

journal homepage: www.elsevier.com/locate/cmrp

Snippets

Tulsi Chugh

D-702, Som Vihar Appartments, RK Puram, New Delhi, 110022, India

ARTICLE INFO

Article history:
Received 13 September 2019
Accepted 16 September 2019
Available online 20 September 2019

Keywords:
Gut microbes
Nipah virus
Infectious disease

1. Beneficial gut microbes

Balanced microbiome community modulated by food intake is a key regulator of host and risk of disease including cancer development and progression. It is further observed that it modulates efficacy of cancer treatment. There is growing scientific data for the gut microbiota as a therapeutic target in various diseases.[1] Microbial consortia of 11 such strains from healthy donor feces that can promote clearance of an intracellular pathogen *Listeria monocytogenes* have been identified. These microbes work together and mediate induction of interferon γ—producing CD8T cells in the intestine. These also enhance therapeutic efficacy of immune inhibitors and improve response to cancer therapy.[2]

It is known that gut microbiome can produce and stimulate production of neurotransmitters and neuroactive compounds (serotonin, gamma-aminobutyric acid (GABA) dopamine) that can modulate and alter host behaviour.[3] Gut microbial cells can work in symbiotic bidirectional relation with the host and influence healthy host metabolic functions in the brain. The microbiome-gut-brain axis is related to mood/behaviour of the host.[4] The Flemish Gut Flora Project shows relation of gut microbiome metabolism and host quality of life and depression.[5] Butyrate-producing *Faecalibacterium* and *Coprococcus* bacteria are strongly associated with high-quality-of-life indicators. *Dialister* and *Coprococcus* species are known to be depleted in patients with mental depression.[6] Studies of fecal metagenomes show microbial synthesis potential of dopamine metabolite 3,4 dihydroxyphenylacetic acid which correlates positively with mental quality of life. Population-scale evidence shows a strong evidence for microbiome to mental health. Unhealthy diet correlates with and is a risk factor for depression.[7] Use of prebiotics and probiotics in fermented food has a strong linkage to our so-called "Gut Feeling." Mental health is not located only in "head" but is intermingled with "nature" and "gut." The microbiome-gut-brain axis communicates with psychic mood and illness.[8]

We all have trillions of organisms that influence our body immunity, metabolism, and probably cognitive functions.

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2. Alzheimer disease infection etiology

In a large prospective study in Taiwan of association between herpes simplex virus (HSV) infections and dementia with randomly selected sex- and age-matched controls of 8362 newly diagnosed HSV infections, multivariable analysis showed an adjusted hazard ratio of 2.564 (95% confidence interval [CI] = 2.351–2.795, $P < 0.001$) for development of dementia in HSV-infected patients.[1]

E-mail address: chughtd@gmail.com.

https://doi.org/10.1016/j.cmrp.2019.09.005
2352-0817

In addition, treatment with antiherpetic medications was associated with a decreased risk of dementia ($P < 0.001$). In another study, beta-amyloid of Alzheimer disease (AD) is rapidly seeded by HSV in animal models.[2] In an editorial on this subject from the National Institute of Neurological Disorders (NIH, Bethesda, USA), the author stated that antiviral therapy reduced the risk of AD by 90.8% and prolonged therapy was more beneficial.[3]

Porphyromonas gingivalis secretes a neurotoxic protease virulence factor (gingipains) which is seen in the brain of patients with AD, and its levels correlate with increased production of AB_{1-42} tau and increased neuroinflammation.[4]

It is, however, yet to be seen if AD development is treatable with antimicrobial agents.

Do Not Ask Me to Remember

Do not ask me to remember,

Don't try to make me understand,

Let me rest and no you are with me,

Kiss my cheek and hold my hand.

Owen Darnell on Alzeihmer

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3. Nipah virus in India

Nipah virus was first described in Australia where it caused fatal infection in 13 horses and a trainer. It is an emerging zoonotic disease reported from Eastern India with high mortality (40–70%). Most human infections occur from close contact with pigs or ingestion of contaminated date palm sap. However, person-person transmission is reported.

In a recent serosurvey of 155 healthcare workers and 124 household close contacts of 18 laboratory-confirmed patients in Kerala, India, three cases of subclinical infections had Nipah virus antibodies (2 had IgM and 1 IgG, and 1 had only IgG). It was observed that the risk was higher after exposure to body fluids of patients than with just physical contacts.[1,2]

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4. Infectious causes of stroke

Stroke is a common cause of all-cause mortality and morbidity worldwide. Apart from vascular causes, there is significant proportion of these cases due to infections, more so in tropical countries and younger patients. Various common examples are malaria, syphilis, tuberculosis, cysticercosis, infective endocarditis, etc.[1,2]

1. Neurologic complications in infective endocarditis are common (25–75%), being second to cardiac failure. The various cerebrovascular complications are ischemic and hemorrhagic strokes (70% and 15%, respectively). These carry a high in-hospital mortality (15–20%). Septic embolization may lead to symptomatic and clinically silent lesions. In addition, microbleeds are seen in more than half the cases, and these lead to mycotic aneurysms.[3] Common organisms are *Staphylococcus aureus*, *Streptococcus bovis*, and fungi. Mycotic aneurysms are seen in 2–4% of cases of infective endocarditis.
2. Oral bacteria play a significant role. Periodontitis is an important risk factor. *Streptococcus mutans* is frequently seen in atherosclerotic plaques. These may accelerate atheromatous changes, increase the risk of plaque rapture, or inhibit platelet activation.[4]
3. Bacterial meningitis and encephalitis: Stroke is seen in 17–43% of meningitis cases, being more common with *Streptococcus pneumoniae* and more often in patients with prior otitis or sinusitis. Vasculopathy (vascular spasm, vasculitis, or thrombosis due to intravascular coagulation) and venous sinus thrombosis are implicated in the etiology.[5] Tubercular meningitis: ischemic stroke is a common complication. Vasculitis and hypercoagulability are contributing factors with decreased protein S and increased Factor V, VIII, and PIA-1.
4. Viruses: HIV, herpes virus, cytomegalovirus (CMV) hepatitis C virus infections are associated with high risk of stroke due to vasculopathy and inflammation.[6]
5. Fungal infections, both yeast and mold, have a high association with stroke and carry a high mortality.

Infectious causes of stroke are often underrealized. However, inflammation in various infectious diseases can lead to stroke. A high index of suspicion, early diagnosis, and intervention is useful.

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Conflict of interest

None.