PSYCHOSIS PATHOPHYSIOLOGY: IS THE ANSWER IN THE GUT?

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Aims and Background

The human body is colonized by trillions microbes, that are collectively referred to as the **human microbiota**. The vast **majority** of the microbes inhabit the **gastrointestinal track** – “**Gut Microbiota**”. The gut microbiota helps to maintain **homeostasis** of the central nervous system through a **bi-directional communication** between the brain, called the “**Gut – Brain Axis**”, **influencing** one’s **behavior and mood**. The **total DNA** of the microbiota constitutes the **microbiome**. Gut **microbiota dysbiosis** has been associated with various **neuropsychiatric disorders** (Alzheimer’s Disease, Mood Disorders), and more recently with **schizophrenia**.
We aimed to make a non systematic review on the microbiota alterations in psychosis.

Methods

An extensive search of the published literature was performed in February 2019. Example search terms included “Gut Microbiota”, “Gut-Brain Axis” and “Psychotic Disorders”. **Original studies** determined by the authors to focus on the role of gut microbiota on psychosis were included

Results

Table 1 - Results

Article	Sample	Findings
Schwarz <i>et al</i> (2017)	28 FEP/16 HC’s	<ul style="list-style-type: none">Pt’s Group Fecal Microbiota (FMT), compared with HC’s → ↑↑↑ <i>Lactobacillaceae</i>, <i>Halothiobacillaceae</i>, <i>Brucellaceae</i>, <i>Micrococcineae</i>, <i>Halothiobacillus</i>, <i>Saccharophagus</i>, <i>Ochrobactrum</i>, <i>Deferribacter</i> and <i>Halorubrum</i>; ↓↓↓ <i>Veillonellaceae</i>, <i>Anabaena</i>, <i>Nitrospira</i> and <i>Gallionella</i><i>Lactobacillaceae</i> changes→ strongest alterations, correlating positively with severity of psychosis
Shen <i>et al</i> (2018)	64 SCZ’s/53 HC’s	<ul style="list-style-type: none">Pt’s Group FMT, compared with HC’s → ↑↑↑ <i>Prevotella</i>, <i>Succinivibrio</i>, <i>Fusobacterium</i>, <i>Lactobacillus</i>, <i>Megasphaera</i>, <i>Acidaminococcus</i>, <i>Citrobacter</i>, <i>Phascolarctobacterium</i> and <i>Desulfovibrio</i>; ↓↓↓ <i>Streptococcus</i>, <i>Coprococcus</i>, <i>Roseburia</i> and <i>Blautia</i>Fecal microbiota based alghoritm was able to identify SCZ’s Pts
Nguyen <i>et al</i> (2018)	25 SCZ’s/25 HC’s	<ul style="list-style-type: none">Pt’s Group FMT, compared with HC’s → ↑↑ <i>Anaerococcus</i>; ↓ <i>Haemophilus</i>, <i>Sutterella</i> and <i>Clostridium</i>Specific microbiome patterns were associated with psychopathological findings
Yuan <i>et al</i> (2018)	41 FEP/41 HC’s	<ul style="list-style-type: none">Pt’s Group FMT, compared with HC’s → ↑↑↑ <i>Clostridium coccoides</i>; ↓↓↓ <i>Bifidobacterium</i>, <i>Escherichia coli</i> and <i>Lactobacillus</i>
He <i>et al</i> (2018)	19 UHR/69 HC’s	<ul style="list-style-type: none">Pt’s Group FMT, compared with HC’s → ↑↑↑ <i>Clostridiales</i>, <i>Lactobacillales</i>, <i>Bacteroidales</i> and <i>Prevotella</i>

FEP - First Psychotic Episode; HC - Healthy Control; Pt – Patient; SCZ - Schizophrenia; UHR - Ultra High Risk (for psychosis)

Discussion and Conclusions

Findings are **inconsistent, not replicated** across studies, and the **directionality** of specific taxa of **different species** is **mixed**. As so, the **extent of conclusions** that can be drawn from available findings at this time is **limited**. However, **each study found changes in the microbiome of the psychotic spectrum patient’s group** (or at least differences in the microbiome comparing to healthy controls), supporting the concept of the gut-brain axis and a **role of microbiome in psychosis**. In one of the studies (*Schwarz et al*) the authors created a microbiome based diagnostic tool, that was able to **identify the schizophrenic patients** in that sample. Two of the studies also suggest that **microbiome changes may be associated with specific clinical features of schizophrenia**.
The clinical implications of these data for the future are exciting. Microbiome research holds **promise for diagnosis, predicting clinical prognosis** and for **therapeutics** in psychiatric disorders like the **psychotic spectrum disorders**.

References

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