Immune Response to Gut Microbes in Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS)

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1. What is ME/CFS?
   - Chronic illness affecting >250,000 people in the UK
   - Onset follows infections, stress, trauma or toxin exposure
   - 58% of long covid patients have ME/CFS
   - 25% of patients are house- or bed-bound
   - Physical, mental or emotional exertion worsens symptoms
   - High symptom burden (Figure 1)
   - Less than 5% of patients recover
   - Gut involvement in pathology [1] (Figure 2)

2. How is the gut involved in ME/CFS pathology?
   - Disturbed gut microbiome
   - Intestinal inflammation
   - Leaky gut
   - Microbes invade the bloodstream
   - Immune response to microbes

3. Who took part in this study?
   - Participant identification centres:
     - Patient
     - Control
     - Severe ME/CFS
     - Matched household controls
   - Inclusion criteria:
     - 5 pairs of severe ME/CFS patients and matched household controls were enrolled onto this study

4. Do ME/CFS patients have increased immune response to gut microbes?
   - What we expected:
     • ME/CFS patients to have a higher number of gut microbes binding to serum antibodies due gut microbes escaping into the blood across the leaky gut barrier
   - What we found:
     • Total level of serum antibodies was normal in ME/CFS patients
     • ME/CFS patients had a lower level of antibodies to self gut microbes
     • ME/CFS patients had a lower level of antibodies to foreign gut microbes
   - What this means:
     • ME/CFS patients have an impaired immune response to leaking gut microbes and foreign microbes
     • Explanation for persistent infections in ME/CFS

5. Which gut microbes are triggering an immune response in ME/CFS patients?
   - What we expected:
     • ME/CFS patients to have a higher number of gut microbes binding to serum antibodies due gut microbes escaping into the blood across the leaky gut barrier
     • To be able to identify gut microbes invading the leaky gut and triggering an immune response in the blood
   - What we found:
     • Level of gut microbes binding to serum antibodies was normal in ME/CFS patients
     • ME/CFS patients have a stronger immune response to \textit{Campylobacter jejuni}
   - What this means:
     • \textit{Campylobacter jejuni} is a food borne pathogen which causes gastroenteritis. It could be the trigger of gut inflammation and a leaky gut in ME/CFS patients

References: