Biolab Medical Unit

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Gut Fermentation Profile

Indications
Candida albicans is a ubiquitous commensal yeast of the mouth and gastrointestinal tract which can produce opportunistic infections in various sites, such as the mouth (oral thrush), genital area (genital thrush), intertriginous areas (intertrigo), nails (paronychia) and small intestine. Very rarely systemic candidiasis is also seen in immunosuppressed patients. Excessive growth of *Candida* in the small intestine results in the production of ethanol from ingested dietary carbohydrate. The alcohol thus produced passes into the blood. The exact identity of the fungus involved is still open to question, but the assumption is that it is the growth of either *Candida* or another yeast that causes the symptoms. Similar gastro-intestinal symptoms are also produced by bacterial overgrowth in the colon and by bacterial dysbiosis secondary to small-intestinal malabsorption.

Since *Candida* is a normal gastro intestinal tract commensal, very low levels of ethanol production in this (blood ethanol < 22 μmol/L) are not considered pathological. In contrast, blood levels of ethanol associated with alcoholic intoxication are c.1000 times higher (> 1000 mg/L or 21.7 mmol/L).

Synonyms
Candida test, glucose challenge test for yeast overgrowth in the gut.

Patient preparation
No food for 3 hours and no alcoholic beverages or food containing alcohol for 24 hours prior to the test.

Specimen requirements
A special kit is required, which can be sent from Biolab (glucose for ingestion and a grey top fluoride oxalate blood tube). The patient is given 1 gram of glucose in hardened gelatine capsules (2 x 500mg capsules), together with 4 grams of glucose dissolved in 80-100ml of water. A blood sample is taken one hour later. **[Note: DO NOT USE AN ALCOHOL SWAB AS THIS CAN AFFECT THE TEST RESULTS]**

Postal samples must reach Biolab within 48 hours of testing.

Price: £46

Methodology
Blood alcohols (ethanol, methanol, butanol, propanol and short chain fatty acids) are measured by gas-liquid chromatography.

Turn around time
3-4 working days.

Interpretation
Increased ethanol with no methanol and only slight increases in other alcohols suggests yeast overgrowth. Increased ethanol with some methanol present and only slight increases in other alcohols suggests that there may have been ingestion of alcohol in the 24 hours prior to the test. An increase in a range of alcohols, but not ethanol, suggests a bacterial dysbiosis in the small intestine, possibly due to malabsorption. Similarly raised levels of short chain fatty acids, with normal or nearly-normal blood alcohols, suggests increased bacterial fermentation in the colon, probably secondary to mild small intestinal malabsorption. Diarrhoea or poor fibre intake decreases levels of short chain fatty acids in this test.

P.T.O.

Key references

1. Hunnisett A, Howard J, Davies S. Gut fermentation (or the 'Auto-brewery') Syndrome: A New Clinical Test with Initial Observations and Discussion of Clinical and Biochemical Implications. J.Nutr.Med. 1990;1:33-8.
2. Eaton KK, McLaren-Howard J, Hunnisett A, Harris M. Abnormal gut fermentation: Laboratory studies reveal deficiency of B vitamins, zinc and magnesium. J.Nutr. Biochem. 1993;4:635-638
3. McLaren-Howard J. Intestinal Dysbiosis - A Review. Complementary Therapies in Medicine. 1993;1:153-157.

Suggested further reading

Environmental Medicine in Clinical Practice, H Anthony, S Birtwistle, K Eaton & J Maberly. British Society for Allergy, Environmental and Nutritional Medicine Publications, Southampton, UK (Tel: 01703-812124).