Correspondence

Methane excretion in man

Sir,—McKay et al.\(^1\) in a recent report have published new data about methane production in ‘various clinical and control populations’. After reviewing the Methods section in this paper — as well as in previous papers by McKay et al \(^2\) and Tadesse et al.\(^3\) I believe that some comments should be made.

According to the authors, the gas chromatograph used in Edinburgh was equipped with a Katherometer (Thermal conductivity) detector which did not detect methane concentrations below 0.09 \(\mu\)mol/l (2 ppm). Their description is one of a rather insensitive system in which air methane concentration is represented by a peak reaching less than 1% of full scale deflection of the recorder.\(^1\) The commonly used gas chromatographs for methane detection are equipped with a flame ionisation detector.\(^6\)–\(^10\)

In our system,\(^10\) methane concentration of 2 ppm produces a peak of about 40% full scale deflection of the recorder. Such a sensitivity enables accurate measurement of concentrations less than 0.5 ppm (10% of full scale).

The group from Edinburgh adopted a definition of methane producers which is different from the ‘traditional’ one suggested by Bond et al.\(^7\) A methane producer — as accepted by most investigators — is a subject whose breath methane exceeds 1 ppm above ambient air concentration. According to McKay et al.\(^2\)–\(^3\) a methane producer should have at least 0.09 \(\mu\)mol/l (2 ppm) above air concentration.

How should we define a subject producing 3.5 ppm methane (with ambient air concentration of 2-0 ppm)? In Edinburgh he will be considered as a non-producer, whereas in Minneapolis, London, or Tel-Aviv he will be recorded as a producer. This situation renders the results from Edinburgh rather incomparable with those published by others.

It is noteworthy that even with their strict criteria McKay et al.\(^1\) have presented the highest percentage of methane producers documented in literature in a control population — 54% of 142 controls (in their previous reports — 60.7% of 56 and 43% of 30), compared with 53.6%, 41%, 44%, 40%, 42.3%, and 50.3% in Minneapolis,\(^7\) Toronto,\(^11\) Oslo,\(^8\) London,\(^12\) Barcelona\(^9\) and Tel-Aviv,\(^10\) respectively.

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References


Reply

Sir,—Thank you for letting us see Dr Peled’s letter. We accept that our method is less sensitive than the flame ionisation method, as indeed we have shown. Our method has the merit of simultaneously measuring the concentration of hydrogen and methane. The limit of sensitivity of our method for methane analysis is 2 ppm (0.09 \(\mu\)mol/l) and for this concentration upwards we can measure breath methane with a precision coefficient of variation of 7%. We have also compared our method with a flame ionisation detector system and the results were comparable at and above a concentration of 2 ppm.
Overall 54% of our 142 control subjects produced methane which is not very different from 50% in Tel-Aviv. Comparing hospital staff and students in this hospital (n=60) with volunteers from a local housing estate (n=82), however, there was a wide difference in percentage methane status, 33% compared with 70% in these respective control populations. From the distribution patterns shown in the Figure, methane concentrations in most producers are greater than 6 ppm and if we are missing some values between 1–2 ppm above room air this would tend to make our incidence rates even higher. A 70% incidence in methane production in a 100 unselected subjects has been quoted by Calloway and Murphy. Most studies, including ours, have used breath samples taken on a single occasion. Pitt et al,3 have shown that a single breath sample might miss an average of 18% of methane producers in a population study. Hence it is possible that all figures quoted in the literature are underestimating the incidence of methane production.

We think that methane is produced in the colon of all normal subjects. Studies in methane producers describe a continuum of concentrations in the breath which are dependent upon methane production in the caecum. The definition of a methane producer is arbitrary. The measurement of flatus methane may be more relevant in the basic issue, which is, what dictates the amount of methane produced in the human colon.

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References

Combined manometry and antimony pH catheter
Sir,—We have recently encountered a problem with a combined manometry and antimony pH catheter (Monocrystant Mod 1010) and felt that others may benefit from our experience.

We had successfully used the catheter on one occasion without problem. During the calibration for a subsequent period of monitoring, however, we noticed that there was a wide variation in the voltage generated when using buffer pH1 (Figure). Subsequent investigations showed that this variation was related to immersion of the manometry channel and close inspection revealed a small collection of fluid in the catheter tip. This was found to be due to partial separation of the inner manometry channel from the surrounding pH catheter.

This artefact disappeared after complete occlusion of the manometry channel which suggested that the leakage provided a short circuit between the central wire within the pH catheter and the external antimony electrode.

We have informed the manufacturers and hope that this will help others to identify the problem more readily.

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