Technical method

A method for bacteriological sampling of surfaces by direct application of culture media

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The level of bacterial contamination of surfaces can be determined by the agar sausage technique of ten Cate (1965). In his description in English, ten Cate compared his 'sausage skin' with Dr W. Litsky's 'syringe-like apparatus' (Walters, 1955) which was described as being cumbersome and requiring costly stocks of syringes.

This report describes the use of disposable 20 or 50 ml plastic syringes for sampling and recommends them as a preferable alternative to the agar sausage.

Method

The needle end of a 20 or 50 ml syringe is cut off so as to expose the whole of the internal diameter, the plunger is then withdrawn half way down the barrel and the syringe is autoclaved for 15 minutes at 121°C. Following this the syringe is supported vertically in a test tube rack and is filled with sterile culture media. We routinely use blood agar in one syringe and MacConkey agar in another. A piece of sterile aluminium foil is folded over the exposed agar surface to avoid contamination. At the same time a knife suitable for cutting the agar is autoclaved. The figure shows a syringe with half an inch of agar projecting, and the knife with its sterile test tube container.

The loaded syringes can be stored with other laboratory media. When needed, a suitable amount of pressure is applied to the plunger to expel about half an inch of medium which is applied to the surface to be sampled. The knife is withdrawn from its test tube container and a disc of the culture medium is cut off and placed in a sterile petri dish, which can then be incubated without further handling. For each batch of specimens the same knife can be used without re-sterilizing.

We are still re-using our original syringes which

Fig. Disposable plastic syringe with agar projecting ready for sampling and the aluminium foil cover. The knife is shown beside its sterile test tube container. The knife handle has been sealed inside the rubber stopper.

were manufactured by Jintan Terumo Co, Ltd, Tokyo; any plastic syringe that will survive repeated autoclaving should be suitable.

Comment

Direct application of culture medium to surfaces in order to determine bacterial contamination has several advantages over other techniques. It eliminates the problem of delicate organisms, or organisms present in small numbers, being lost from a swab. It also gives a more accurate indication of the total number and relative proportions of bacteria present, for example, in skin ulcers.

This method results in substantial savings of media

and swabs. The use of plastic syringes, now readily available, brings this technique within reach of the routine diagnostic bacteriology laboratory.

References

- ten Cate, L. (1965). A note on a simple and rapid method of bacteriological sampling by means of agar sausages. *J. appl. Bact.*, **28**, 221-223.
- Walters, W. G. (1955). In symposium on methods for determining bacterial contamination on surfaces. *Bact. Rev.*, **19**, 284-287.

Letter to the Editor

Coulter Blood Count

May we comment on the paper by Hamilton and Davidson (*J. clin. Path.*, 1973, **26**, 700-705). We are glad that they have pointed out that with the Coulter counter model S

$$\frac{\text{Hb}}{\text{PCV}} = \frac{\text{MCH}}{\text{MCV}} = \text{MCHC}$$

In our experience MCV and MCH normally move together and divergence, other than when due to impaired haemoglobinization of the red cells (iron deficiency, thalassaemia, anaemia of infection), suggests a need to re-calibrate the Coulter. If the lower limit of the MCV is 80 fl, then this corresponds to an MCH of 27 pg. An MCV of 80 and an MCH, for example of 26.7, usually suggests machine error. When both values are still within the normal range, divergence of MCV and MCH may be suggested by an abnormal MCHC as shown in the example in the table.

Change in MCV on storage of blood occurs if the specimens are left at room temperature, but not if they are kept at 4°C, at least for up to 120 hours.

Finally, a fall in the MCV and MCH is the earliest detectable change in the

Coulter blood count in iron deficiency, and precedes any fall in the MCHC.

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Note from Dr Yvonne Cossart

In my review of Professor A. J. Zuckerman's interesting book, *Hepatitis Associated Antigen and Viruses* (*J. clin. Path.*, **26**, 728), I commented on his apparent attribution of 'the recognition of post-transfusion hepatitis' to himself. I am pleased to find that this was a misinterpretation of his reference to a chapter in an earlier book, *Virus Diseases of the Liver*, where a number of the original references may be found.

	Correct Coulter Setting	RBC Drift	Normal Range when Trapped Plasma Excluded from PCV
Hb	14.5	14.5	—
RBC	4.93	5.20	—
PCV	42.3	44.5	—
MCV	86	86	80-90
MCH	29.4	27.9	27-32
MCHC	34.3	32.6	32.9-35.5