Letters to the Editor

Bacillus cereus infections

The importance of *Bacillus* organisms, particularly *B. cereus*, in local infections has been largely overlooked because they are commonly encountered as contaminants in specimens or cultures. Turnbull *et al.* (*J Clin Pathol* 1979;32:289-93) reported severe infections with *B. cereus* and prompted me to review the recent isolates in this laboratory.

In the nine months, November 1978 to July 1979, there have been nine significant isolates of *Bacillus*. Details of these infections are given in the Table. Infected traumatic or surgical wounds of the limbs account for nearly half these cases, but clinical severity is very variable. It is my experience that moderate or heavy growths of *Bacillus* from wounds are usually of clinical significance.

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In view of recent publications on *B. cereus* and its pathogenicity in serious wound infections due to necrotising toxins,¹⁻⁴ I should like to report the following four cases which we have seen during the past four months. (Table opposite)

In three of these four cases the strain of *B. cereus* isolated was a strong producer of

toxin, and certainly in case 3 was the only pathogen isolated, and it is likely that this organism played a significant role in these infections.

In case 4 the wound swab was taken five days after starting ampicillin, to which *B. cereus* was resistant, and the pyrexia settled after a further two days of treatment. Since this strain was shown to be a weak product of toxin it is unlikely to have played a major pathogenic role in this patient.

It is most important to consider *B. cereus* as a potential pathogen in wound sepsis, and toxin testing may be useful to assess its significance in individual cases.

I am grateful to Dr Peter Turnbull, of the Food Hygiene Laboratory, Central Public Health Laboratory, Colindale, for serotyping and toxin testing these strains.

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References

- 1 Turnbull PCB, Kramer JM, Jorgensen K, Gilbert RJ, Melling J. Properties and production characteristics of vomiting, diarrheal, and necrotizing toxins of *Bacillus cereus*. *Am J Clin Nutr* 1979; 32:219-28.
- 2 Turnbull PCB, Jorgensen K, Kramer JM, Gilbert RJ, Parry JM. Severe clinical conditions associated with *Bacillus cereus* and the apparent involvement of exotoxins. *J Clin Pathol* 1979; 32:289-93.
- 3 Tuazon CU, Murray HW, Levy C, Solny MN, Curtin JA, Sheagren JN. Serious infections from *Bacillus* sp. *JAMA* 1979; 241:1137-40.
- 4 Fitzpatrick DJ, Turnbull PCB, Keane CT, English LF. Two gas-gangrene-like infections due to *Bacillus cereus*. *Br J Surg* 1979;66:577-79.

The letters from Drs Barnham and White are important in supporting and emphasising the existence of a problem of *Bacillus* organisms in local infections. Accordingly, we wish to draw to the attention of readers our interest in the immunological responses to such infections, particularly those involving *B. cereus* and *B. anthracis*, which relate to the toxic products of these organisms.

In addition to the non-anthrax *Bacillus* cultures, which should continue to be sent to the Food Hygiene Laboratory, we should like to obtain serum from patients in whom there is good evidence of infection with *Bacillus* organisms as primary pathogens. Such serum samples should be sent to the Vaccine Research Laboratory, CAMR, Porton, Wilts.

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Patient	Age	Sex	Disease	Site swabbed	B. cereus or sp.	Specimens positive	Bacterial growth	Other organisms isolated	Clinical severity
1	28	M	Cholecystectomy wound infection. Generalised toxic urticated erythema	Wound	cereus	1	Moderate	<i>Staph. aureus</i> on later swab	Severe
2	24	M	Traumatic amputation of foot	Wound	cereus	2	Heavy	<i>E. coli</i> on one occasion	Mild
3	8 days	F	Jaundice, Sticky eye	Eye	cereus	1	Moderate	—	Mild
4	29	F	Pyrexia after Caesarian section	Vagina	cereus	1	Moderate	—	Mild
5	52	M	Amputated toe, wound infection	Wound	sp.	1	Moderate	—	Moderate
6	21	F	Thigh abscess, cellulitis, septic arthritis of knee 2 weeks after plank fell on thigh	Thigh abscess; knee pus	sp.	2	Moderate	—	Severe
7	56	F	Infected bone graft to fractured tibia. Skin necrosis + + +	Wound	cereus	1	Heavy	—	Moderate
8	64	M	Infected transvesical prostatectomy wound	Wound	cereus	1	Moderate	—	Moderate
9	74	M	Infected suprapubic prostatectomy drain wound	Wound	sp.	1	Heavy	—	Moderate

Case	Age	Sex	Clinical details	Direct microscopy	Culture	<i>B. cereus</i> type	Toxin* category
1	23	F	Diabetic with abscesses of the neck	Pus cells present. Gram-positive cocci	(1) <i>Staph. epidermidis</i> (2) <i>B. cereus</i>	NT	4
2	37	M	Wound infection with necrosis under POP 1 month after orthopaedic surgery to foot	No pus cells. Numerous Gram-positive cocci and moderate numbers of Gram-negative rods	(1) <i>Staph. aureus</i> (2) <i>B. cereus</i>	20	4
3	35	M	Wound infection—necrosis tissue and ulceration leading to a communication with the knee joint, after patellectomy for trauma	Pus cells present. No organisms seen	(1) <i>B. cereus</i>	20	5
4	31	F	Pyrexia and wound infection—at the site of Caesarian section and later reimplantation of ureter	Numerous pus cells and Gram-positive rods	(1) <i>B. cereus</i> (2) Scanty <i>Proteus</i> sp.	NT	2

*Categories 4 and 5 represent strong production of the toxin (as measured by a vascular permeability reaction, including skin necrosis). Categories 2 and 3 represent intermediate production, and 1 weak production.

Book reviews

Oncogenesis and Herpesviruses, III. Part 1. Edited by G. de Thé, W. Henle, and F. Rapp. (Pp 580; illustrated; \$30, Sw. Fr. 50.) Lyon: I.A.R.C. Publications no. 24. 1978.

This book is the proceedings of the third symposium on 'Oncogenesis and Herpesviruses'—in this instance held in Cambridge, Massachusetts in 1977. It is not a book for most clinical pathologists, being a collection of papers on the molecular biology of herpesviruses. However, for the specialist research worker in the field, it is invaluable and contains some of the exciting developments that have taken place in recent years. These are largely due to the introduction of techniques such as restriction enzyme analysis, and the results of its application to herpes DNA are to be found throughout the contents. Thus these are papers describing the mapping of genes coding for virus-specified polypeptides on the viral genome and the characterisation of virus DNA from transformed cells. The scope of the papers is of course wider than this, and there are sections which deal with virus antigens and virus macromolecular synthesis in permissive and non-permissive cells. The bulk of the papers are on herpes simplex virus, but there are sizable contributions on Epstein-Barr virus, cytomegalovirus, and a few of the animal herpesviruses. The only criticism I have is that some of the papers have been overtaken by publications in scientific journals, and the book would have been of greater value if it had been

possible to publish it in one year rather than two years after the symposium took place.

MORAG C TIMBURY

Oncogenesis and Herpesviruses, III. Part 2. Edited by G. de Thé, W. Henle, and F. Rapp. (Pp 522; illustrated; \$30, Sw. Fr. 50.) Lyon: I.A.R.C. Publications no. 24. 1978.

The second part of the symposium will be of greater interest to medical readers since it is on host-virus interactions, both *in vitro* and *in vivo*. Epstein-Barr virus dominates the papers, although other human herpesviruses, as well as those of various animal species, are included. Possibly the most interesting contributions to a clinical pathologist are those which deal with latency and with the immune response to Epstein-Barr virus infection. Both these fields are 'growth points' at present, and this book contains much new and interesting data on them. Although not a book for the general reader, it will be indispensable for workers in the field, which includes not only herpes virologists, but the larger number of workers involved in the investigation of the role of viruses in cancer.

MORAG C TIMBURY

Contributions to Nephrology. Vol 15. 'Nephrologic Problems of the Newborn'. Ed JF Pascual and PL Calcagno. (Pp vi + 77; illustrated; Sw Fr 35.) Basel: S Karger. 1979.

This slim volume is the product of a

symposium on paediatric nephrology, held in San Juan, Puerto Rico, in May 1976 under the guidance of Dr JF Pascual of San Juan and Dr PL Calcagno of Georgetown University, Washington DC, USA. It consists of review articles by well-established figures in paediatric nephrology (Edelmann, McCrory, Arneil, Gruskin, Pascual, Calcagno) on nephrological topics related to the newborn.

This is an example of secondary literature in that most of the authors have presented their material in a more definitive form elsewhere. The volume will be of little interest to those who are conversant with the field, and of little value to those who are not. The sterling price is not quoted but must be at least £10. At 15p per page the temptation to illegal use of the Xerox will be strong.

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Advances in Shock Research. Vol 1. Ed AM Lefer, T Saba, and LM Mela. Vol 2. Ed W Schumer, JJ Spitzer, and BE Marshall. Vol 1 (Pp xv + 285; illustrated; \$30.00.) Vol 2 (Pp xvii + 298; illustrated; \$30.00.) New York: Alan R Liss Inc. 1979.

These two volumes are the proceedings of a conference on shock held in Airlie, Virginia in June 1978. The papers in Volume 1 range over a variety of aspects concerned with hypovolaemic (oligaemic), cardiogenic, and splanchnic shock, and related aspects of hypoxia and ischaemia. Its introductory chapter is by Richard Lillehei, who gives an interesting historical analysis of induced vasodilatation for