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Comparison of Sodium Amylosulfate and Sodium Polyanetholsulfonate in Blood Culture Media

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A comparison between sodium polyanetholsulfonate and sodium amylosulfate in unvented vacuum blood culture bottles containing tryptic soy broth was made with 5,800 sets of blood cultures. No statistically significant differences in isolation rates of bacteria were noted.

Because of its anticoagulant, anticomplementary, and antiphagocytic properties, sodium polyanetholsulfonate (SPS) has been widely used in recent years in blood culture media. Of concern, however, has been the known inhibitory effect in vitro of SPS on anaerobic cocci (2, 3, 6) and, more specifically, on *Peptostreptococcus anaerobius* (4). For this reason, commercially available blood culture media commonly contain SPS in concentrations of only 0.025%. This concern has spawned an interest in a newly synthesized sulfated polysaccharide, sodium amylosulfate (SAS) (7, 8).

During April and early May 1975 we collected, by previously described techniques (9), 2,300 sets of blood cultures. Blood was inoculated in parallel on a 10% (vol/vol) basis into each of three vacuum blood culture bottles containing tryptic soy broth (TSB) with CO_2. Two of the bottles contained 0.025% SPS and the third contained 0.05% SAS (supplied through the courtesy of Difco Laboratories). One of the two bottles with SPS was vented transiently, as recommended elsewhere (1, 5), while the other remained unvented. Since the primary interest in this study was in the possible improved recovery of anaerobic cocci in media containing SAS, the bottle containing SAS also remained unvented. Routine subcultures of each bottle were carried out on the day of blood collection and after 48 h as recommended elsewhere (5).

To determine what effects a lower concentration of SAS has on bacterial recovery, during June and July 1975 an additional 3,500 sets of blood cultures were collected, as described above, except that SAS was present at a concentration of 0.025% rather than 0.05%.

In the first phase of the study (0.05% SAS), there were 121 positive cultures obtained from 91 patients. There were no statistically significant differences between isolation rates by organism group in unvented TSB containing 0.025% SPS and in unvented TSB containing 0.05% SAS. In this phase of the study anaerobic cocci (*Peptococcus asaccharolyticus*) were isolated from only one culture, and that was from a bottle of TSB with SAS.

In the second phase of the study (0.025% SAS), there were 234 positive cultures obtained from 114 patients. Again, there were no statistically significant differences between isolation rates by organism group in unvented TSB containing 0.025% SPS and in unvented TSB containing 0.025% SAS. *Peptostreptococcus intermedius* (not aerotolerant after subcultures in air and 10% CO_2) was isolated from five cultures representing two patients with polymicrobial bacteremia. Other anaerobic cocci were *Peptococcus* and *Veillonella* isolated in five cultures from one and two patients, respectively. These were isolated, with one exception, only from TSB with SAS.

The isolation rates in both phases of the study have been combined into Table 1. Although statistically significant differences between the two media by organism group could not be demonstrated, there were 31 more isolates in SPS only than in SAS only, of which 11 represented presumed contaminants (*Corynebacterium* and *Staphylococcus epidermidis*). In general, there were more isolates of *Escherichia, Klebsiella, Haemophilus,* and *Pseudomonas* in TSB containing SPS.

The results of this study have demonstrated little more than the fact that SPS and SAS appear generally to perform equally well, under the experimental conditions specified, and that there were no isolates of *P. anaerobius* in TSB containing either SAS or SPS.

Of the 395 bacteria isolated, anaerobic cocci accounted for 11 (2.8%). Of the 11 anaerobic cocci, two were isolated from TSB containing both additives, one was isolated from TSB with SPS only, and eight were isolated from TSB

TABLE 1. *Isolation rates in TSB containing SPS and SAS*

Organism	Both	SPS only	SAS only
Corynebacterium	8	20	16
Clostridium	0	1	0
Escherichia	53	21	15
Citrobacter	0	1	2
Klebsiella	13	7	1
Enterobacter	8	1	1
Serratia	7	2	3
Proteus	12	0	2
Providencia	1	0	0
Haemophilus	2	5	0
Streptococcus			
S. pneumoniae	3	0	1
Viridans group	12	5	3
Other	13	2	1
Eubacterium	1	0	0
Acinetobacter	1	0	1
Alcaligenes	0	2	0
Bacteroidaceae	16	8	7
Staphylococcus aureus	26	12	9
S. epidermidis	11	15	7
Peptostreptococcus	2	0	3
Peptococcus	0	0	2
Veillonella	0	1	3
Pseudomonas	15	8	3

with SAS only. Whether or not this apparent trend would become statistically significant with more positive cultures containing anaerobic cocci is, of course, unknown and would require considerably more comparative studies for us to answer definitively. With the anaerobic cocci accounting for less than 3% and *Peptostreptococcus* accounting for only 1.2% of all of our isolates, it is difficult for us to render an unqualified recommendation for the replacement of SPS by SAS in blood culture media.

Certainly, if additional clinical studies in other medical centers establish the superiority of media containing SAS, there would be no doubt about recommending its use. Another consideration is that it is as yet unknown how costly SAS will be in relation to SPS. Finally, one potential disadvantage of SAS might be that certain gram-negative bacilli are less frequently recovered from blood culture media containing it at concentrations of 0.025 to 0.05%.

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