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Clinical Evaluation of Sodium Amylosulfate in Human Blood Cultures

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Sodium amylosulfate was shown to be a useful anticoagulant additive for increased isolation of bacteria from clinical blood cultures.

Indications are that the use of an anticoagulant additive aids in the recovery of bacteria from blood cultures (1, 5). One study suggested that sodium polyanethol sulfonate, a blood culture additive, did not increase the frequency of recovery of organisms in blood cultures (4).

Sodium amylosulfate (S-A-S), a new polyanionic, heat-stable anticoagulant, has been previously shown to inactivate antibacterial substances in artificially inoculated blood cultures (2, 3). This report presents data showing that sodium amylosulfate is as effective as sodium polyanethol sulfonate in clinical blood cultures and that additives are useful in blood cultures.

The blood culture medium used was either thioglycolate medium or Trypticase soy broth (Baltimore Biological Laboratory, Cockeysville, Md.). Sodium amylosulfate (S-A-S, Searle Diagnostic Inc., Columbus, Ohio) and sodium polyanethol sulfonate (Grobax, Roche Diagnostic Inc., Nutley, N.J.) were added to the media at 0.05% (wt/vol) before autoclaving. In the first part of the study, Trypticase soy broth cultures with and without sodium amylosulfate were compared. The second part of the study was a comparison of sodium amylosulfate and sodium polyanethol sulfonate in thioglycolate medium. In all cases, 5 ml of blood was added to 50 ml of medium and incubated at 37 C. The bottles were subcultured on days 1, 7, and 14 to blood agar and chocolate agar. All plates were incubated at 37 C both aerobically and anaerobically in a GasPak (BD, Cockeysville, Md.). Organisms were identified by routine laboratory methods.

From the data of the first 117 blood cultures (Table 1), it appears likely that seven positive cultures would have been missed if an additive were not used. This group included *Pseudomononas aeruginosa*, *Klebsiella* sp, *Escherichia coli*, and *Staphylococcus aureus*. These organisms were not considered contaminants. These data disagree with those of Minkus and Moffet (4), who claimed that an additive did not increase the frequency of organisms judged to be associated with clinical infections, whereas the data do agree with the findings of Finegold et al. (1). The assumed contamination rate in our study was the same with and without additives.

The second part of the study showed that sodium amylosulfate was as efficacious as sodium polyanethol sulfonate in a blood culture system (Table 2). These data agreed with those of J. Morello (personal communication), who compared sodium amylosulfate and sodium polyanethol sulfonate in a blood culture study with 500 clinical specimens in duplicate. There

TABLE 1. *Organisms isolated from blood culture with and without sodium amylosulfate (S-A-S)*

Organism	Positive with S-A-S[a]	Positive without S-A-S[a]
Pseudomonas aeruginosa	3	2
Klebsiella sp.[b]	3	1[c]
Escherichia coli	1	0
Haemophilus influenzae	2	2
Staphylococcus aureus[d]	3	0
Beta hemolytic streptococcus (not group A)	3	3
Staphylococcus epidermidis	2	2

[a] Medium used was Trypticase soy broth.
[b] All isolated from same patient in duplicate blood cultures at 30-min intervals.
[c] No growth until 8 days after specimen was taken.
[d] All isolated from same patient in duplicate blood cultures at 30-min intervals.

TABLE 2. *Organisms isolated from blood cultures with S-A-S[a] and SPS[b]*

Organisms isolated	Number of organisms isolated[c]	
	Positive with S-A-S™	Positive with SPS
Escherichia coli	13	13
Bacteroides sp.	2	2
Neisseria meningitidis	1	1
Peptococcus sp.	1	1
Enterobacter sp.	1	1
Staphylococcus aureus	2	2
Clostridium perfringens	0	1
C. perfringens and Diplococcus pneumoniae	1	2
D. pneumoniae	1	1
Alpha streptococcus	1	0
Peptostreptococcus sp. and *E. coli*	2	2

[a] S-A-S, sodium amylosulfate.
[b] SPS, sodium polyanethol sulfonate.
[c] Medium used was thioglycolate.

were 24 positive cultures with sodium amylosulfate and 25 with sodium polyanethol sulfonate.

Of the 473 cultures noted in this study, by chance a wide diversity of organisms were isolated. Artificial blood cultures of aerobes (3) and anaerobes (F. E. Kocka and R. L. Searcy, Abstr. Annu. Meet. Amer. Soc. Microbiol., 1973) have indicated the usefulness of sodium amylosulfate. An advantage of sodium amylosulfate over polyanethol sulfonate is that sodium amylosulfate does not inhibit certain anaerobic cocci that are inhibited by sodium polyanethol sulfonate as shown in artificial cultures (Kocka, Arthur, and Searcy, Amer. J. Clin. Pathol., in press). In this study sodium polyanethol sulfonate inhibited 7 out of 16 clinical isolates of *Peptostreptococcus*.

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