Reviewer's report

Title: A Study of Empyema Thoracis And Role of Intrapleural Streptokinase in its Management

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Reviewer: graham simpson

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The authors are to be congratulated on trying to provide another perspective on the use of intrapleural fibrinolytic with particularly reference to treatment of chronic and tuberculous empyema. Unfortunately the report needs major modifications before it can fulfill its objectives. The authors describe a series of 31 patients treated over a 6 year period. In the part of this period intrapleural streptokinase was used with the 19 of 31 patients treated without streptokinase acting as historical controls. Unfortunately the clinical and laboratory details do not adequately separate the groups treated with streptokinase from those treated simply by intercostal drainage and so no useful conclusions can be drawn as to whether streptokinase improved outcome, even allowing for the fact that the controls were historical so that other aspects of management may have changed. The empyemas are described as chronic but the duration of symptoms had a huge range from three days to three years and again it would be helpful to separate the patients into those presenting early and those with truly chronic empyemas. The same sort of strictures apply to the patients with tuberculous effusions. With regard to the tuberculous effusions it is certainly surprising that there were no confirmatory bacteriological cultures of TB and the diagnosis was made purely on radiological features suggestive of pulmonary tuberculosis. It is certainly possible that at least some of these patient had bacterial empyemas and co-incidental scars of old pulmonary TB. It would also be of interest to know whether the patients with presumed tuberculous empyemas improved simply with tuberculosis treatment.

Apart from these general issues, there are a number of specific points. In the Background, on page 3, I think it is going too far in saying that open surgical drainage has been replaced by VATS, particularly in the more chronic empyemas. The authors state that fibrinolytic agents make the pus thinner. This is incorrect and it has now clearly been shown that fibrinolytics have no effect on pus viscosity1,2. It seems that fibrinolytics can work only by breaking down loculation and the reduced pus viscosity noted as far back as Sherry and Tibbett’s 1949 report was attributable to the streptococcal DNase present in their impure preparation. The references quoted in this section seem to have been misnumbered.

In the Methods, I found the dose of streptokinase confusion. I assume 2.5lacIU means 250,000IU. The description of the repeat dosage schedule given towards the bottom of page 5 is confusing. It would also be helpful to know whether or not the intercostal tubes placed for drainage were placed under imaging and whether more than one drainage tube was required and also for how long drainage had been performed before streptokinase was used in the group receiving streptokinase and give the loculation of the fluid mentioned.

In the Results section, as mentioned above, there is little to be drawn from the clinical and laboratory data unless these are separated as suggested above. The microbiological results are slightly surprising. Apart from a failure to grow Mycobacterium tuberculosis the predominance of Gram negative organisms is unusual. The commonest organisms are of course in the Streptococcus anginosimilleri group and these are not mentioned. As far as treatment goes, it is not clear why metronidazole was the commonest antibiotic used. Aminoglycosides are generally regarded as not helpful in treating empyema as penetration into the pleural space is poor and the drugs are
inactivated by the low pH’s found in empyema fluid.

The main outcome measure is the increased pus drainage seen after instillation of streptokinase. Unfortunately this is now known to be meaningless as streptokinase itself stimulates secretion of pleural fluid3. It would be helpful to have some objective description of radiological improvement in the various groups as well as details of hospital stay and so on. The only quoted difference between the streptokinase and the non-streptokinase groups is for surgical decortication which was not significant.

The Discussion is generally very fair. In page 10 it is stated that surgical procedures were reduced in the patients receiving streptokinase, although this was not significant. The discussion on page 11 about the mechanism by which fibrinolytic agents work, needs to be revised in view of the light of data on viscosity referred above.

Table 1 is probably superfluous unless the streptokinase and non-streptokinase groups are separated. The information in Table 2 could probably simply be given in the text. In Table 3, I think the quoted success rates would not really be claimed by the authors of the papers quoted and this column should be removed. Furthermore, the labeling is incorrect in that figures in parenthesis denote the reference number and the number of patients in each study is given in a separate column.

References