

Systemic Streptokinase In Acute Myocardial Infarction

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SUMMARY :

Intracoronary streptokinase therapy since its greater clinical use has significantly decreased the hospital mortality of patients with acute myocardial infarction. It requires a functioning cardiological team with the possibility of cardiosurgical intervention. In general hospitals these conditions are not available. Does this mean, that the patient with AMI is there confronted with a much poorer prognosis? The answer is given by analysis of an own patient group treated with the systemic intravenous streptokinase therapy. The data show, that iv-high dose short treatment with streptokinase has as favourable results as intracoronary application. It can be done in any general hospital.

Concerning therapy of the acute myocardial infarct a review-article in the german monthly "Der Internist" writes in November 1980: For the acute myocardial infarct an optimal and generally excepted principal of treatment is still in discussion. This discussions starts with the advice to treat the acute infarct at home and ends with the recommendation of early cardiovascular operation for revascularisation (3).

With the intracoronary thrombolysis it is to day possible to reopen the coronary vessel leading to the infarct area, in about 70 to 80%. This therapy requires however a good functioning cardiological team with the possibility of cardiosurgical intervention. Up to day the experiences show, that hospital mortality with successful thrombolysis is significant lower than after the so called conservative treatment (8).

However, the greater part of AMI-patients is primarily admitted to hospitals without this highly spezialized equipment. Must they than suffer a poorer prognosis?

The clinical research work of Schroeder (6, 7) shows that a systemic high dose short time thrombolysis with streptokinase within the first 3 hours after infarct beginning is able to reopen

closed coronary vessels in 60 to 70%. Final results concerning this problem are not yet available. Among others these results are to be expected from the on-going ISAM study.

These thoughts in mind we looked over our own data of infarct patients from the years 1980 - 83, in a retrospective analysis.

METHODS :

In 1980 and 1981 we performed a standard intravenous thrombolysis with streptokinase initiated with 500,000 U prime-dose in the first half hour, followed by 2.2 Mill. U streptokinase in 20 hours as sustaing dose. A history of high blood pressure, stroke, chronic liver desease, stomach or duodenal ulcers and coagulation defects excluded from streptokinase application. The hemodynamic deterioration of patients was the only indication for starting thrombolytic therapy. The infarct duration, expecially the 2-3 hours limit was not considered. In total 136 infarct-patients were treated in our intensive care unit. 52 of them were more than 70 years old, streptokinase was administered in 42 patients.

In the years 1982 and 1983 the streptokinase dose and indication were changed. A short time thrombolysis with 1,5 Mill. U over 1 hour was

performed whenever the infarct was younger than 3 hours. Other parameters of the cardiac conditions were not considered. Among 122 patients 52 were more than 70 years old, 30 of them were treated with streptokinase. All patients were given an initial dose of steroids: Prednison 250 mg - 1,500 mg.

RESULTS :

The side effects of streptokinase in both groups were unimportant. Allergic skin reactions were not seen. In some cases there was a short drop in blood pressure, critical shock reactions were observed only in single cases. Bleeding complications most often occurred as hemorrhage around the venal punctures spots. There were some cases with a hemoglobin below 10 grams and the necessity of blood transfusions. The total mortality of both groups is within the international standard which shows a range between 16-30% and a tendency towards 20% since the beginning seventies (1).

In our two patients groups we have to realize the high amount of patients older than 70 years with the complications of chronic bronchitis in pulmonary emphysema often in combination with silikosis. The total mortality in the 1980/81 group was 26% with an average age of 76.5 years in the group over 70. It is reduced to 14% in the patients under 70 years with an average age of 58,9.

Total mortality in the 82/83 group was 20% (0 age 75,5 in the subgroup over 70). It is reduced to 11% in the subgroup under 70 years. (Table 1-3, figure 1-3).

TABLE No. 1 :

1980/81		STANDARDLYSIS	
total number of patients	n = 136	died: 36	= 26 %
with streptokinase	: 42	"	: 11 = 26 %
without "	: 94	"	: 25 = 27 %
age under 70 years	: 84	died: 12	= 14 %
" over " "	: 52	"	: 24 = 46 %
" under 70 " with strep.	: 33	"	: 6 = 18 %
" under 70 " without "	: 51	"	: 6 = 12 %
" over 70 " with "	: 9	"	: 5 = 55 %
" over 70 " without "	: 43	"	: 19 = 44 %

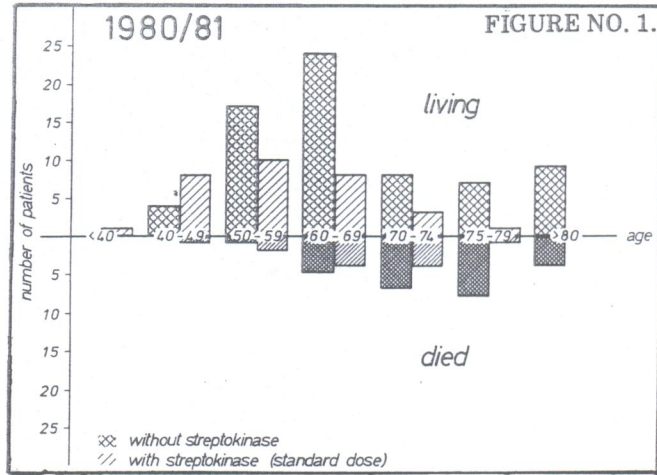


TABLE 1 and Figure 1: "Standardlysis" :
Total mortality increase with age. There is no difference between the groups treated with and without streptokinase.

TABLE No. 2 :

1982/83		HIGH-DOSE SHORT TIME LYSIS	
total number of patients	n = 122	died: 24	= 20 %
with streptokinase	: 39	"	: 3 = 8 %
without "	: 83	"	: 21 = 25 %
age under 70 years	: 71	died: 8	= 11 %
" over " "	: 51	"	: 16 = 31 %
" under 70 " with strep.	: 31	"	: 2 = 6 %
" under 70 " without "	: 40	"	: 6 = 15 %
" over 70 " with "	: 8	"	: 1 = 13 %
" over 70 " without "	: 43	"	: 15 = 35 %

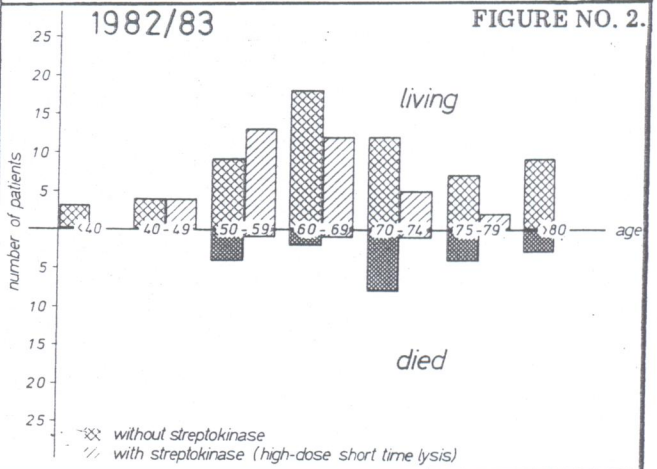


TABLE 2 and Figure 2: "High dose short time lysis with streptokinase" :

Total mortality increases with age. There is a marked difference between the two groups treated with and without high dose short time lysis with a much lower mortality in the streptokinase subgroup.

TABLE No. 3 :

1980/81		STANDARDLYSIS	
total number of patients	n = 136	died: 36	= 26 %
with streptokinase	: 42	" : 11	= 26 %
without "	: 94	" : 25	= 27 %

1982/83		HIGH-DOSE SHORT TIME LYSIS	
total number of patients	n = 122	died: 24	= 20 %
with streptokinase	: 39	" : 3	= 8 %
without "	: 83	" : 21	= 25 %

FIGURE NO. 3.

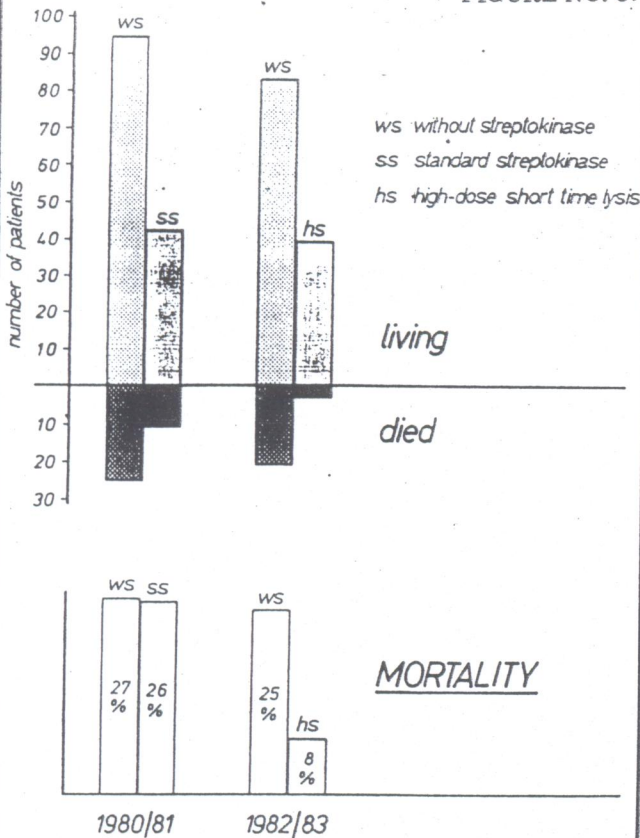


TABLE 3 and Figure 3: "Standardlysis" does not lower the total mortality. High dose short time lysis however shows a significant low mortality in the streptokinase subgroup.

DISCUSSION :

In the 1980/81 group treated with the standard intravenous streptokinase there were more patients with acute and prolonged cardiogenic shock who's infarct had started more than 6 hours ago. Here thrombolysis could not lower the mortality. Expected possitive effects by improving the flow qualities of the blood and by re-opening of closed coronary vessels were not achieved, most probably because the streptokinase application was given to late (table 1, figure 1).

in the 82/83 group however treated with the early high dose short time thrombolysis with streptokinase, not considering the cardiac total condition, the mortality rate of 8% in comparison to 25% in the control group was significant lower. This was so as well in the subgroup under 70 with a mortality of 6% as in the patients older than 70 years with 13%. (Table 2, figure 2).

The early reperfusion of reopened coronary arteries and in consequence the rescue of myocardial tissue could be an explanation for these data.

Our results are in agreement with the publications which have already shown, that intravenous streptokinase is in a very good competition to intracoronary streptokinase (2, 4-7). From the results of our patients in 1982/83 (Figure 3, Table 3) we would like to answer the initially asked question: Even without the possibility of intracoronary streptokinase therapy any patient with acute myocardial infarct can be treated without deteriorating the prognosis in each hospital which knows how to handle the intravenous high dose short time thrombolysis with streptokinase. There is no necessity in this method to control the coagulation factors of the blood.

A reopened vessel generally shows morphological damage with atherosclerotic plaques or narrowing. This means, that successful thrombolysis has to be followed by a well controlled anticoagulation therapy. This therapy has to be continued until coronary angiography is performed, leading either to PTD (percutaneous transluminal dilatation) or to bypass surgery.

In 1984 most of our streptokinase patients underwent later coronary angiography. It will be of interest to control the morphological results of what we think was clinical successful thrombolysis. These data are being reviewed at present and not yet available.

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