Re-Perfusion Therapy for Patients with Acute Myocardial Infarction (AMI) in Sudan, *Sudan Heart Institute (SHI) Experience.*

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Abstract:

Introduction:

Timely administration of reperfusion therapy (thrombolysis or Primary PCI) to patients with Acute MI is vital in reducing extent and severity of myocardial damage and favorably affecting long term prognosis (1-12). This area was extensively studied all around the globe , however there are no previous published reports on the practice in this area in Sudan.

Aim of Study

The aim of this trial is to study the reperfusion therapy and practice in SHI, reflecting the practice in this area in Sudan.

Method:

Patients admitted to SHI with the final diagnosis of AMI in the year 2011 were included.Patients' data were retrospectively analyzed for the rate of reperfusion therapy and outcome.

Findings:

In the year 2011, 68 patients labeled with AMI were included. 72% were males while 28% were females. The mean age of patients was 57 Years.

Reperfusion therapy was offered to 38 patients (56%) while 30 patients (44%) were denied therapy. The main reason for therapy rejection was late presentation. Of those patients who received reperfusion therapy, 8 patients were treated by primary PCI (21% of the total patients re-perfused and 31% of the patients presenting to SHI within the 12 hour therapeutic window). It was not possible to estimate the door to needle time. The door to balloon time for those patients who received 1ry PCI was 135 minutes.

The overall EF in all patients was low at 42% with no significant difference between those who received re-perfusion therapy and those who were denied therapy (44% and 41% respectively).

Conclusion:

Rate of re-perfusion in patients with AMI in Sudan was low and this was mainly due to late presentation of patients and occasionally non availability of thrombolytic therapy. This has resulted in significant irreversible myocardial insult and low EF. All efforts should be exerted to ensure early administration of this vital treatment.

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Key words: Acute Myocardial Infarction, **Thrombolysis, Primary PCI**

Introduction:

Re-perfusion therapy either medically by thrombolysis, or mechanically by Primary Percutaneous Coronary Intervention (1ry PCI) is the treatment of choice offered to patients presenting with acute Myocardial Infarction (AMI) within 12 hours of the onset of

symptoms. Early administration of this therapy saves lives and prevents myocardial damage and later heart failure.
Sudan heart institute (SHI) is on of the first cardiac hospital in Sudan and patients are referred from all over the country for acute and long term management of cardiac problems. This includes patients with AMI. The thrombolytic agent available for patients with MI is streptokinase and our practice in SHI is to offer this vital therapy to patients in the Emergency Room before admission to hospital wards, to avoid unnecessary delay in administration of this therapy.
In SHI, 1ry PCI is offered to eligible patients at the discretion of the treating physician, provided that the patient arrived at a suitable time where long delay of the procedure is not expected. In this retrospective study we give an account of our experience with re-perfusion therapy in SHI. We analyze the patients' clinical characteristics, the options of therapy given and the outcome of patients receiving such treatment.

To our knowledge this is the first paper to address this experience in Sudan. We would hope it will throw some light in this area of practice and grant us some future directives.

Study type:

This is a retrospective single centre study undetaken at Sudan heart Institute in Khartoum for the period January 2011 and January 2012.

Data Collection:

We searched in the Coronary care unit admission log book for all patients with the final diagnosis of AMI. Patients' records were retrieved and doctors' reports were examined. Patients were also interviewed through telephone calls to fill anymissing data. We examined the door to needle and door to balloon times, response to re-perfusion therapy and in-hospital outcome.

Difficulties in data collection:

We encountered difficulty in estimating the actual time of arrival and time of therapy administration, since most of the time this was not recorded on patients ' notes. Frequently, we have to rely on the time recorded on the ECG tracing paper and the time of admission to CCU post thrombolysis, and in some patients we have to rely on the time on the print out of the patients CBC films allowing suitable time for collection and processing of samples. To estimate the door to balloon time we have to utilize the time of entering the data of the patient in the cath lab interface or the time of admission to the cath lab and the timing of the different recorded filming events of the procedure on the angiography film.
Unfortunately, Echocardiography films are not stored in discs and we have to refer to the findings from the echo reports and the summery on the outpatient follow up cards to extract information about the Ejection fraction (EF). Due to this poor recording of timing of events, we think that the results related to these timings should be interpreted with caution. However, other results related to outcome of therapy and in-hospital course should not be affected.

Data findings:

During January 2011 to January 2012 there were 68 patients admitted with the final diagnosis of AMI to SHI either directly (i.e. first medical contact was SHI) or referred

from other hospitals (Table 1). 54 patients (79.4%) were admitted to one of Khartoum Hospitals and 10 patients (14.7%) were referred from hospitals outside Khartoum. In 4 patients (0.05%) we could not identify their place of primary presentation. 33 patients(48.5% of total patients) presented primarily to SHI (first medical contact was SHI).

The mean age of all patients was 57 years. 72% of patients were males and 28 % of patients were females.38 (56%) of all patients received re-perfusion therapy while 30 (44%) of patients were denied therapy. The vast majority of those patients who were denied therapy were mainly patients refered from peripheral hospitals Figure (1). The common reason for denial of therapy was late presentation followed by non availability of thrombolytic therapy.

Table 1: showing patients demographic data and status and type of reperfusion.

Gender	**Number(%)**
Males	49(72%)
Females	19 (28%)
Mean (age)	57
Mean (LVEF %)	42%
Reperfusion	38 (56%)
Primary PCI	8 (12%)
Thrombolysis	30 (44%)
Denied reperfusion	30 (44%)

The total number of patients presenting with AMI to Sudan heart Institute were 33 patients, 26 (79%) patients of them received reperfusion therapy and 7patients (21%)were denied therapy mainly due to late presentation.

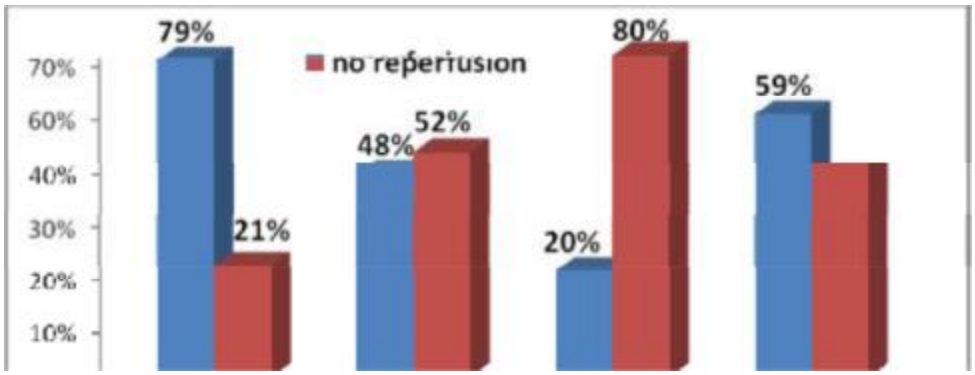

Figure (1): reperfusion status according to patients' first hospital contact.
Abbrev: *SHI: Sudan Heart Institute, KRT: Khartoum hospitals, Other: Hospitals outside Khartoum.*

Of the 33 patients who presented with AMI to SHI, 8 patients underwent primary PCI (this represents 24% of the total number of patients presenting with AMI and 31% of those patients eligible for re-perfusion therapy). 18 patients received thrombolytic therapy (55% of the total number of patients presenting with AMI and 69 % of those who are eligible for re-perfusion therapy).
It was not possible to estimate the door to needle time due to poor timing recordings in most patients files. We assumed that this was probably excessively prolonged (if you do not record it then you do not appreciate its significance and you probably do not thrive to administer it in a timely manner!!).
It was possible, however, to calculate the mean door to balloon time for patients who underwent 1ry PCI, thanks to the automatic timing recording of events by the cath lab machines. The mean door to balloon time was found to be 135 minutes.

The overall mean EF in all patients was low at 42% with no significant difference between those who received re-perfusion therapy and those who were denied therapy(44% and 41% respectively) Figure (2).

Figure (2): EF according to re-perfusion status

In those patients who underwent 1ry PCI, TIMI3 flow was achieved in 7 patients and 7 patients were stented. One patient underwent emergency bypass surgery. There were no in hospital deaths.

Conclusion:

This small trial showed that there is less optimum recording of the process and timings of patients' treatment; this would obviously hinder auditing the practice in this area. There was poor recording of time of arrival of patients and subsequent management steps.

The only available thrombolytic agent in Sudan is streptokinase. The fact that repeated use of this drug is generally prohibited and that it needs a long duration of administration, may call for other thrombolytic agents to be available especially formulas with short duration of administration and no problems with repeated dosing 13.

Patients presenting with AMI have generally poor long term prognosis as indicated bythe poor mean EF (42%). The main reason for this seems to be either failure to administer re-perfusion therapy or its late administration. Other possible reasons related to severity of disease need to be explored by trials.

Good percentage of patients presenting within the therapeutic window received primary PCI in SHI (31% of eligible patients), with acceptable timing and excellent angiographic and short term outcome. This indicates that primary PCI seems a feasible safe procedure with excellent door to balloon time which is not far longer than the recommended standards. It seems logistics and in hospital availability of staff are not major obstacles in timely and efficiently performing these procedures and hence we recommend adopting this as the preferred re-perfusion therapy of choice.

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