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Research Article

A COMPARATIVE STUDY BETWEEN ST- ELEVATION ACUTE MYOCARDIAL INFARCTION IN DIABETIC AND NON-DIABETIC PATIENTS

¹Dr Faiqa Sarwar, ²Dr Muhammad Abu Bakar Siddique, ²Dr Muhammad Talha

¹Ganga Ram Hospital Lahore, ²Allied / DHQ Hospital Faisalabad.

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Abstract:

Objective: To compare transmission, control of disease and some other aspects between the patients of diabetes and non-diabetic people admitted with ST- segment elevation acute myocardial infarction (STEMI).

Material and Method: This study was conducted at Ganga Ram Hospital Lahore and the duration of this study was from January 2020 to December 2020. The total number of participants in this study was 240. 70 were the patients of diabetes and 164 were non-diabetic.

Results: 11 patients among diabetic patients were recently detected. Female to male ratio in the diabetic disease was 1:1.5 but female to male ratio in the non-diabetic participants was 1:5.8. ST- segment elevation acute myocardial infarction was observed in high rates in the patients of diabetes than non-diabetic patients at the age from 55 years to 64 years. 82% patients reported at hospital within 6 hours of the start of the pain in the chest. About 53% were smoking from many years, 40% patients found with fully established dyslipidaemia, about 33% patients were fat, 32% patients were suffering of diabetes and 29% were the cases of hypertension. An important amount of the non-diabetic patients was smoking from many years but an important percentage of the diabetic patients were fat. Dyslipidaemia was concluded as a major danger factor in the patients of diabetes but it was at number three in the case of non-diabetic patients. The sideways infarction was much frequent in the patients of diabetes. The level of Trop-T was less in 46% and high in 54% patients of diabetes. The level of Trop-T was found negative in 10%, discoverable in 3%, less in 39% and high in 48% non-diabetic patients. The average amount of different enzymes did not present any disparity between the patients of diabetes and non-diabetics as Trop-T, CK and CK-MB. The average duration spent by the patients in the hospital was about 5.99±1.04 days.

Conclusion: Fatness, smoking, dyslipidaemia were the major danger factors of ST- segment elevation acute myocardial infarction. The most common site is anterior Infarction. In the patients of diabetes, the probability of ST- segment elevation acute myocardial infarction is similar in men and women but in the non-diabetics it is six men to one woman.

Key Words: Acute Myocardial Infarction, Diabetes, Danger Aspects, Dyslipidaemia.

Corresponding author:**Faiqa Sarwar,**

Ganga Ram Hospital Lahore.

QR code



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INTRODUCTION:

AMI (Acute myocardial infarction) is one vital reason of serious emergencies and is occurring in high amounts in the countries which are under development [1]. Some danger aspects incline to acute myocardial infarction which is classified as amendable as high cholesterol in the blood, smoking, fatness, hypertension, laziness and diabetes and non-modifiable risk factor are gender, age and heart diseases in the family. Diabetes is a common trouble of the whole world and it is highly occurred in old age, with fatness and less activity of the body. There is a supposition about the diabetes in the youngsters that it was 2.8% in the year 2000 but it will reach to 4.4% in the year 2030 [2]. It was also reported that most of those patients will be from China, India and USA [3]. The danger of AMI is two to four times greater in the patients of diabetes [4, 5]. Therefore, it is a cause of emergencies and deaths among the patients of diabetes [6]. The latter is 4 times greater in the men patients of diabetes and 8 times greater in the women diabetes patients [7]. 10 to 20% of acute myocardial infarction patients are the patients of diabetes in France [8, 9]. The medical signs of acute myocardial infarction are different in the diabetes and non-diabetic patients as minor pain is most frequent in the patients of diabetes [10, 11]. The current study was undertaken to assess the status of STEMI in diabetics and non-diabetics coupled with epidemiology and risk factors.

METHODOLOGY:

This study was conducted at Ganga Ram Hospital Lahore and the duration of this study was from January 2020 to December 2020. It was conducted on two hundred and forty patients of diabetes and non-diabetics STEMI. Patients of fifteen years to seventy-five years of age & of either gender with a previous history of pain in the chest greater than thirty minutes but less than one day with elevation in the ST-

segment were entered in this research work. Newly detected patients of diabetes by WHO (World Health Organization) standards [12] and already confirmed diabetes patients were entered into the group of diabetes. At the time of admission in hospital, whole previous history of every participant was documented. A twelve lead electro cardiograph of every participant was carried out at the time of arrival at hospital or chest pain started as told by patients or ninety minutes after the injection of streptokinase which was then evaluated for elevation in the ST segment. The participants were separated into four various groups on the basis of elevation in the ST segment in various leads.

V1 – V6 = Anterior acute myocardial infarction
 II, III, aVF = Inferior acute myocardial infarction
 II, III, aVF+ V4R = Inferior & Right ventricular acute myocardial infarction
 I, aVL, V5, V6 = Lateral acute myocardial infarction

The samples of five millilitres blood was gathered from every patient who was under research. These samples of blood were evaluated for various enzymes with the help of special kit. The glucose level in the blood was resolved in the blood samples from the patients who were not confirmed diabetes with the help of special kit Centronics. A special kit Bican was used for the determination of the HbA1c on the complete samples of the blood. Verbal permission from every patient was taken to enter them in the research work. Chi square method was used for the analysis of the collected information [13].

RESULTS:

32% participants were the patients of diabetes and 68% patients were non-diabetic. Among the patients of diabetes, 85.5% were the confirmed patients of diabetes but 14.5% were detected with this disease recently.

Gender	Non-diabetic%(n)	Diabetic%(n)	Combined / Overall%(n)
Male	85.4*(140)	59.2*(45)	77.1(185)
Female	14.6**(24)	40.8**(31)	22.9(55)
	P = 0.001 ÷ 2 = 49.00	P = 0.023 ÷ 2 = 5.16	P = 0.001 ÷ 2 = 29.16

The values in a row with

* P = 0.001 (÷2 = 12.79)

** P = 0.00001 (÷2 = 20.03)

The disparity in the occurrence of STEMI in both types of patients was no significant except 55 to 64 year of age in which it was much greater in the patients of diabetes. Most of the patients reached at hospital within 6 hours on onset of the pain in chest. The availability of the risk factors is described in Table-2.

Parameters	Non-diabetic (n = 164)		Diabetic (n = 76)		Total patients(n = 240)	
	No	%	No	%	No	%
Hypertension	43	26.2	26	34.2	69	28.7
Smoking	103	62.8 *	23	30.3 *	126	52.5
Obesity (BMI > 30)	46	28.0 **	32	42.1 **	78	32.5
Dyslipidemia	62	37.8	34	44.74	96	40
Prior History of IHD	32	19.5	15	19.7	47	19.6
Family history of IHD	13	7.9	2	2.6	15	6.2

The values in a row with

* vary significantly at $P = 0.000003$ ($\div 2 = 22.00$)

** vary significantly at $P = 0.03$ ($\div 2 = 4.71$)

The percentage of the smokers was 52.5%, 32.5% patients were fat and 28.7% were suffering of hypertension. Smokers were in higher quantity in non-diabetics and fat patients were more in diabetics group. Lateral infarction was found in high quantity in patients of diabetes but the disparity in the infarction site at various other sites was not important as described in Table-3.

Site of Infarction	No. of Patients(n = 240)		Total Patients%(n)
	Non-diabetic%(n)	Diabetic%(n)	
Anterior AMI(V1-V6)	55.5(91)	50.0(38)	53.8(129)
Inferior AMI(II, III, aVF)	31.1(51)	28.9(22)	30.4(73)
Inferior + right ventricular AMI(II, III, aVF+V4R)	8.5(14)	6.6(5)	7.9(19)
Lateral AMI(I, aVL, V5, V6)	4.9 *(8)	14.5 *(11)	7.9(19)

The values in a row with * $P = 0.01$ ($\div 2 = 6.27$)

The level Trop-T was less in 46% in the patients of diabetes and high in 54% patients. The level of Trop-T was negative in 10%, discoverable in 3%, less in 39% and high in 48% non-diabetic patients. The average duration spend by every patient in the hospital was 6.06 ± 2.42 days.

DISCUSSION:

Coronary artery thrombosis is the main cause of AMI [14]. Many research works carried out in the past which the cause of CHD (coronary heart disease) [15]. The increase in the patients of diabetes is due to the urbanizations in the developing countries which influences the metabolism [16]. Diabetes increases the danger of CHD [17]. 68% patients with STEMI were non diabetic which is very much close to another research where 27% patients were of diabetes. A research work from Karachi concluded that 43.4% patients of acute myocardial infarction were diabetic. Recently discovered diabetes patients

were 7.8 to 15.4% in males and from 5.8% to 12.4% in females in Mexico [20]. High rate of IHD in men than women is concluded in a research from England and from Karachi [9]. Ayub gave an average age of 55.69 ± 13.45 year [2] and Liuzzo gave an average age of 61 ± 11 years. In another research work, acute myocardial infarction found in 26.5% patients in the age below 55 years, 23.1% patients of the age of 55 to 64 years, 27.7% patients in the age of 65 to 74 years, 18.9% patients in the age of seventy-five to eighty-four years and 3.8% patients were more than eighty-five year of age [17]. So, the outcomes of this research are similar to the results of other works carried out in the field. Non-existence of pain in chest was observed in 8% diabetes patients and 4% in the non-diabetic. Another research work concluded the absence of pain in chest in 16.9% patients of diabetes and 15% of non-diabetics. Our results are similar to the research carried out in Canada in which every patient of acute myocardial infarction was found with

chest pain. The patients of diabetes were more suffering from hypertension as compared to non-diabetics. This result is very similar to the other research works carried out in Pakistan. Atmaca also stated that diabetes patients are more hypertensive than non-diabetics. Culic also stated 47.7% anterior site in his study.

CONCLUSION:

Many risk factors of STEMI as fatness, smoking etc. The very common site is anterior Infarction. The chances of STEMI are same in the males and female's patients of diabetes but it was different in men and women in the non-diabetics.

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