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RETROSPECTIVE QUANTITATIVE ANALYSIS OF INCIDENCE OF MYOCARDIAL INFARCTION AMONG KNOWN PATIENTS OF ISCHAEMIC STROKE

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Abstract:
Objective: Whether or not patients of ischaemic stroke should undergo investigations for coronary artery disease (asymptomatic) is debatable yet scarcely ever have the risk of vascular death and myocardial infarction after a stroke been quantitatively evaluated. Immediately preceding the incidence of an acute stroke, a high risk of recurrence is seen yet the prime factor driving up mortality rates after a stroke is myocardial infarction and coronary artery disease. This paper hopes to indirectly assess the risk of schaemic heart disease in patients who have formerly faced episode(s) of acute ischaemic stroke.
Methodology: A sample of consecutive 100 known cases of Myocardial Infarction presenting at Liaquat University Hospital, Department of Cardiology (Emergency and Out-Patient Department) was included in this retrospective quantitative analysis during the month of January 2016. After taking written informed consent, inquiries were made regarding previous incidences of ischaemic stroke (if any) and the time elapsed since the incident. Inquiries were also made regarding previous history of cardiac illness. The data obtained was analyzed using SPSS v. 17.
Results: 60% of the sample comprised of males while 40% comprised of females, each with a mean age of 59 years and 65 years respectively. 20 out of a total of 100 patients presenting with Myocardial Infarction gave affirmative previous history of ischaemic stroke. 80% of the patients with a positive history of ischaemic stroke were males while the remaining 20% with a positive history were females.
Conclusion : A careful evaluation of the results reveals that incidence of myocardial infarction among known patients of ischaemic stroke is worrisomely high. More worryingly the incidence is particularly higher in males as compared to females.
Keywords: *Ischaemic Stroke, Myocardial Infarction, Retrospective & Quantitative Analysis*

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INTRODUCTION:

Myocardial infarction and stroke have quite a many risk factors in common and in addition to that pathophysiological mechanisms too are similar to an extent [1]. In comparison to the population at large, the patients with stroke are at a greater mortality risk and the high risk is surprising not due to the cerebrovascular phenomenon but owing to the an increased risk of myocardial infarction [2].

Despite this, assessment of cardiac health is not recommended at present in non-symptomatic patients presenting with a recent history of ischemic stroke. A fresh set of statements issued by the American Heart Association and the American Stroke Association call for a need to weigh individual risk in an attempt to identify patients with the greatest propensity for coronary artery disease after a stroke [2]. The international pool of literature is still devoid of any reliable estimation of the incidence of myocardial infarction after stroke, and populations at risk are yet to be identified.

The need is particularly pressing because cardiovascular disease is the sole leading cause of deaths around the world [3], amounting to a loss of £19 billion per annum to the economy of the United Kingdom alone, with the National Health Service of the country troubled with an expenditure of an estimated £6.8 billion on ailments of cardiovascular origin in 2012/2013 [4]. Owing to the ageing population of the country and worldwide hike in non-contractible ailments, the burden of this deadly duo of ailments is set on a steep incline to the top as the most worrying public health concern [5].

Speaing in detail the main culprit and the key similar factor in the individual patho-physiologies of ischaemic stroke, coronary artery disease and myocardial infarction is atherosclerosis [6]. It is well known that an acute atherosclerotic event anywhere in the body increases the probability of another one in the same or another vascular bed [7]. After an initial incidence of ischaemic stroke, the likelihood of another in the cerebral of any other (particularly) cardiac vascular bed is very high for some time and remains somewhat elevated in the long run as well and thus the incidence of atherosclerotic events leading to MI are high [6, 8 & 9].

A great many researchers have studied the relationship between myocardial infarction and stroke yet, the results obtained are weak at best since they exhibit varying statistics regarding the rate of subsequent myocardial infarction [8, 10 & 11], with great differences in the final incidence of silent coronary artery disease fluctuating from fifteen percent to eighty percent following acute ischaemic stroke [12, 13].

Hoping to shed more light on the issue, we made a quantitative approach and conducted this study to determine the incidence myocardial infarction in known cases of ischaemic stroke in the absence of former cardiac ailment. This study, to the best of our intellect, is the sole such study taking a retrospective approach to date.

METHODOLOGY:

A sample of consecutive 100 known cases of Myocardial Infarction presenting at Liaquat University Hospital, Department of Cardiology (Emergency and Out-Patient Department) was included in this retrospective quantitative analysis during the month of January 2016. After taking written informed consent, inquiries were made regarding previous incidences of ischaemic stroke (if any) and the time elapsed since the incident. Inquiries were also made regarding previous history of cardiac illness. The data obtained was analyzed using SPSS v. 17.

Myocardial infarction was ascertained using by means of history, clinical evaluation, pathological investigations, ECG and formal coronary angiography. Pre-established medical diagnosis was sought for ischaemic stroke by means of medical records, computed tomography scans of the brain and reports. Care was taken take detailed history to determine that the ischaemic stroke had in fact happened prior to the episode of myocardial infarction and not otherwise. Also, great emphasis was made to not overlook any signs of silent cardiac ailment preceding the stroke.

RESULTS:

60% of the sample comprised of males while 40% comprised of females, each with a mean age of 59 years and 65 years respectively.
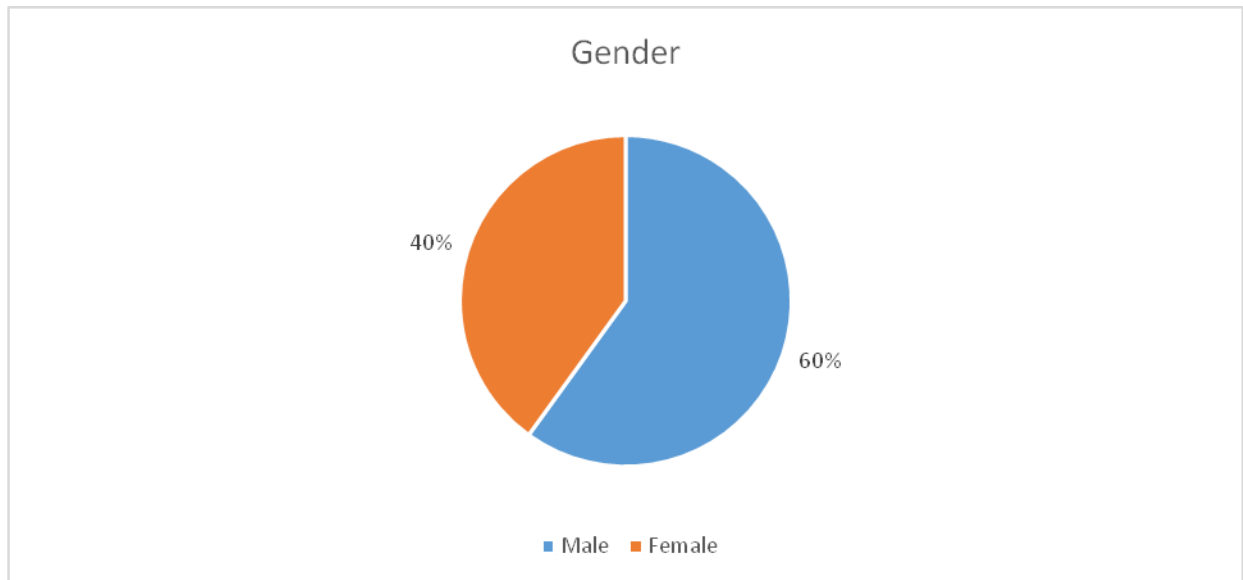
Fig 1: The gender gap is consistent with the findings reported in international literature. The reasons vary from the cardio-protective effect of certain female hormones that males lack and the different lifestyle stress levels of both the genders.

20 out of a total of 100 patients presenting with Myocardial Infarction gave affirmative previous history of ischaemic stroke.
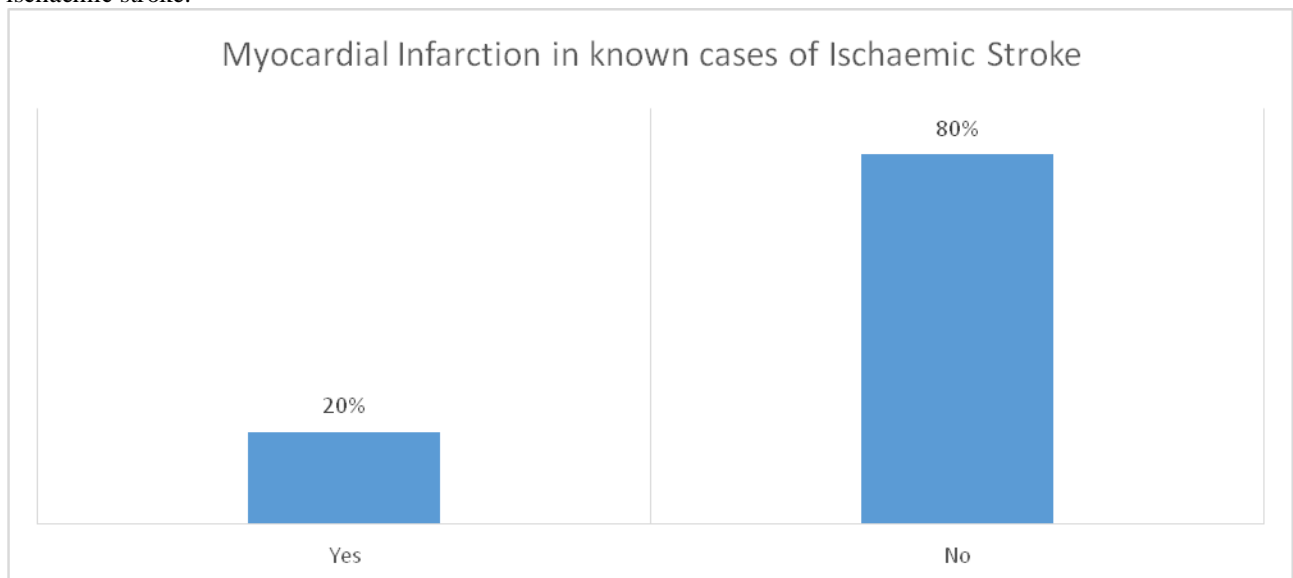

Fig 2: All the patients who gave positive history had interestingly experienced ischaemic stoke prior to this episode of myocardial infarction and none otherwise. All were screened negative for any old history of cardiac ailments and this serves to validate the quality of our results.

80% of the patients with a positive history of ischaemic stroke were males while the remaining 20% with a positive history were females. Thus the incidence of myocardial infarction among known cases of ischaemic stroke (male) stood at 32%, while the incidence of myocardial infarction in known cases of ischaemic stroke (females) stood at only 8%.
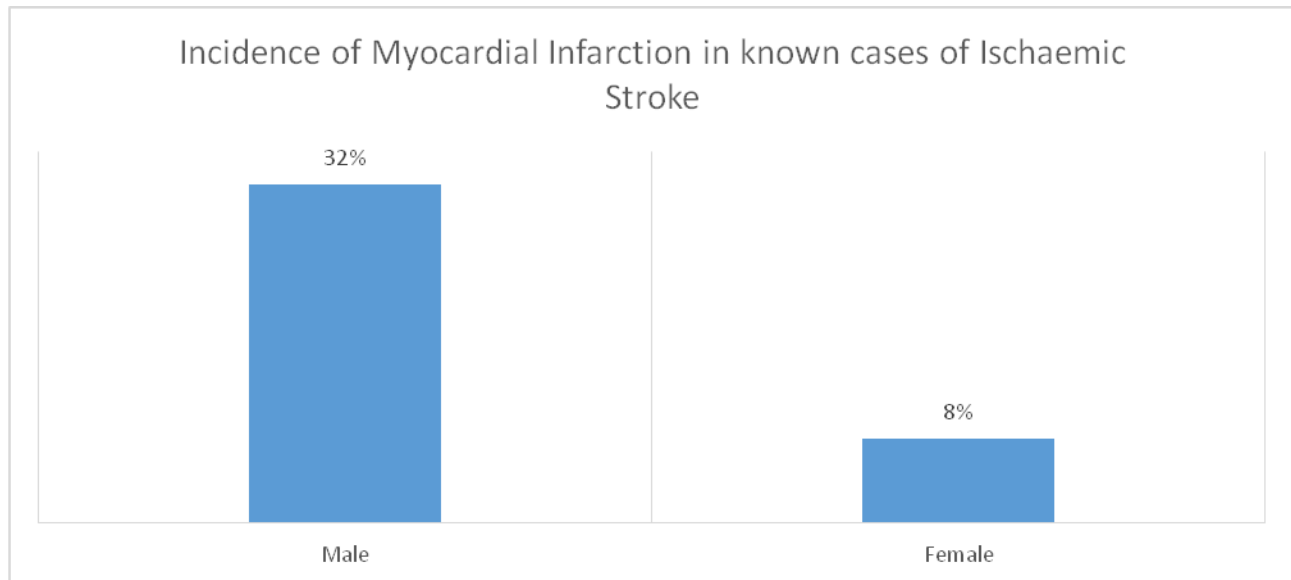
Fig 3: The incidence was higher in men, as compared to women. The reasons were not investigated owing to the quantitative nature of the study, future attempts at exploring this phenomenon should include a qualitative approach as well.

DISCUSSION:

According to the results of some prominent meta-analysis, immediately following an ischaemic stroke, the chances of myocardial infarction are two percent two percent per year worldwide. This risk is normally deemed a great risk in many sets of guidelines for evaluation of the risk of cardiovascular mal-event [14, 15]. Probable results derived from meta-regressions making use of a good many works of prominent researchers including works done on the hospital- and community-based sample populations aligned nicely seen at the individual level. Yet, whether or not patients of ischaemic stroke should be evaluated to assess the risk of silent coronary artery disease is being debated upon in the face of such striking eveidence in support of the former stance [2]. The work of investigators and researchers have proposed that twenty five percent to sixty percent of patients with ischaemic stroke lacking any previous history of cardiac ailment may be victims of silent myocardial ischemia [2], and an investigator un-earthed that about 1/3rd of patients (including those with cerebrovascular mal-events) screened prior to carotid surgery had one stenosis in the coronary artery in seventy percent of the cases. [14] Although our study states that there is a high incidence of myocardial mal-even after a stroke is pretty high, there is a fair probability that many of the patients will not fall victim to it. This finding is in harmony to what the Framingham cohort proposed [15]. Hence, it stays unclear whether or not the classic factors solely forecast the ultimate incidence of myocardial infarction after an ischaemic stroke [16, 17].

Provided the strong proof establishing associations between cardiac mal-events with cerebrovascular accidents, [18, 19] and our findings, it is highly probable a lot more patients with a history of ischaemic heart disease may be at risk of and may ultimately develop myocardial infarction than formerly believed. Our results are validated by the existing pool of international research literature that shows a high disease burden despite lack of any previous systemic ailment. The Asymptomatic Myocardial Ischemia in Stroke and Atherosclerotic Disease (AMISTAD) [20], the Multiple Atherosclerosis Site in Stroke (MASS) [21] and the Stroke Prevention by Aggressive Reduction in Cholesterol Levels (SPARCL) trial are a few such examples [22] .

The literature pool however is not all bad news and the beneficial effects of blood pressure reduction on altering this phenomenon is also proven [23]. Our results support proposals of the American Heart Association and American Stroke Association recommending that patients with stroke be considered for further cardiac evaluation on the basis of their individual cardiovascular risk factor profile [24, 25].

CONCLUSION:

A careful evaluation of the results reveals that incidence of myocardial infarction among known patients of ischaemic stroke is worrisomely high. More worryingly the incidence is particularly higher in males as compared to females.

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