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ACUTE MYOCARDIAL INFARCTION AMONG URBAN AND RURAL POPULATION OF PAKISTAN

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Abstract

Background and Objectives:

Acute myocardial infarction (AMI) is myocardial necrosis resulting from acute obstruction of coronary artery. Its symptoms include chest pain or discomfort, dyspnea, nausea and diaphoresis. Diagnosis is made by findings on ECG and by raised cardiac biomarkers in blood. AMI is one of the leading cause of death worldwide. This study was carried out in cardiac complex Emergency department, BVH Bahawalpur to determine the frequency of acute myocardial infarction among urban and rural populations. Objective was to determine the frequency of acute myocardial infarction among urban and rural population and determine risk factor distribution among them.

Material & Methods:

The sample include patients from urban and rural population of age group i.e. 20 years-80 years, both males and females, visiting cardiac complex emergency department, BVH with acute chest pain and positive ECG findings for AMI. A sample of 35 patients visiting cardiac complex emergency department, BVH was taken using non- probability convenient sampling. Information was collected through structured questionnaire.

Results:

Total 350 patients were interviewed, 217 (62%) were from rural area, 133 (38%) were from urban area. 260 (74.3%) were males, 90 (25.7%) were females. 153 (43.7%) were smokers, 197 (56.3%) were non-smoker. 220 (62.9%) belonged to low socioeconomic class, 130 (37.1%) belonged to middle socioeconomic class.

Conclusion:

According to my study most of the patients of Acute MI were old aged, males, smokers and were from rural area.

Key words: acute myocardial infarction, urban and rural population

Introduction

Acute myocardial infarction (AMI) or heart attack is a major cause of death in the Pakistan and worldwide. Pakistan is an agricultural country with more population in rural areas. There are social, cultural, dietary and educational differences between rural and urban people. These differences have

effects on disease pattern as well. In this study, we examine rural–urban differences of acute myocardial infarction patients in Pakistan.

Rural–urban differences in presentation, treatment and outcomes of acute myocardial infarction remain a very important public health concern.[1] Previous studies have found a significant difference in care of acute myocardial infarction between hospitals in rural and urban areas.[2, 3] Rural area patients usually present first to a local rural area hospital and from there if recognized early are almost always referred to tertiary care hospital. This first encounter is very important for early referral.

Bahawalpur division (study population) comprises of both urban and rural areas, predominant rural areas and compared to urban residents, those in rural areas tend to be less educated and belong to a lower socioeconomic status, a higher burden of chronic diseases, and poorer access to preventive health care services such as cholesterol screening and cardiac rehabilitation.

Traditionally, general public perception is that, heart diseases are more prevalent in urban areas due many factors like unhealthy fast food eating dietary pattern, more pollution due to vehicle smoke and industries, lack of time for physical activities, less intake of fresh fruits and vegetables and a perception of stressful life in cities. Historically, ischemic heart disease is also thought to be more prevalent in developed world. This all is contrary to current data. So this makes the rationale to conduct a study to find differences responsible for this.

In addition, rural residents face a number of barriers to receiving optimal care after an acute myocardial infarction.[4] Quality cardiology care services and facilities are available only in Bahawal Victoria Hospital and Cardiac Center Bahawalpur. Due to high early mortality some patients may not have sufficient time to travel to these hospitals. Although a rural AMI patient may ultimately receive care at an urban hospital, Emergency Medical Services (EMS) travel time and treatment during transport may not be optimal.[5]

In Pakistan, no study has directly observed rural and urban distribution of acute myocardial infarction, which could have important effects on outcome as noted above. Variations in medical treatment, access to health services, and types of comorbidities can result in differences in mortality outcomes. Therefore, this study provides a baseline data set of rural-urban AMI distribution.

Materials & Methods

After approval from ethical committee of hospital, informed consent was taken. 350 patients presented in emergency of Cardiac Center Bahawalpur, of both gender between 30 to 70 years were included in the study by non probability consecutive sampling. This cross sectional descriptive study was carried out between 1st May 2019 to 20 July 2019. Data was collected by interview. It contains information related to the demographic profile of the participants (age, gender, occupation and place). Data were analyzed through SPSS version 16.0. Quantitative variable like age was measured by Mean ± Standard deviation. Qualitative variables like diabetes, hypertension, socioeconomic class and smoking have been presented as frequency and percentages. Confounding variables were controlled by stratification.

RESULTS: The study showed 265 (75.7%) were males and 85 (24.3%) were females. 217 (62%) belonged to rural area and 133 (38%) belonged to urban area.

170 (48.6%) were from age group 40-59 years, 160 (45.7%) were from age group 60-80. Mean age was 54±3.2 SD. 153 (43.71%) were smokers and non-smokers were 197 (56.28%). Similarly diabetes and hypertension distribution is shown in table 3 and 4. Table 5 shows distribution of patients by socioeconomic status. The occupational status of patients was, among females all were house wives i.e. 94 (26.8%). Among male patients 114 (32.57%) were laborer, 56 (16%) were shopkeepers, 25 (7.14%) were landlord, 35 (10%) were drivers and 30 (8.6%) were retired persons.

Table 1: Rural urban distribution

Population	Numbers	Percentage
Rural	217	62%
Urban	133	38%

Table 2: Smoker-Nonsmoker distribution in our study population

	Rural	Urban
Smoker	80(36.8%)	73 (54.8%)
Nonsmoker	137 (63.1%)	60(45.1%)
Total	217	133

Table 3: Diabetic and Nondiabetic distribution in our study population

	Rural	Urban
Diabetes	73(33.61%)	47(35%)
Non-Diabetes	144(66.35%)	86(64.66%)
Total	217	133

Table 4: Hypertension and non-hypertension

	Rural	Urban
Hypertension	102(47%)	73(54.8%)
Non hypertensives	115(53%)	50(44.12%)
Total	217	133

Table 5: Socioeconomic Class Distribution

Socioeconomic status	Rural	Urban
Low(≤20K PKR/month)	70(32%)	78(58%)
Middle(20k-100k PKR/month)	120(55%)	27(20%)
High(≥100k PKR/month)	27(12.44%)	28(21%)
Total	217	133

Discussion

A Study regarding frequency of acute myocardial infarction among urban and rural population was conducted at Cardiac Complex Emergency Department Bahawalpur. In our study the main reason for increased frequency of AMI among rural population was lack of knowledge regarding the risk factors of the disease. Age, male gender and cigarette smoking were found important risk factors in the study. Poor health facilities in rural area also contributes to increased frequency of disease among rural population and this also contribute to their late presentation and complications.

A study found rural–urban disparities in AMI frequency and mortality differences in Nebraska between 2005 and 2009. They found that patients in urban areas have lower odds of 30-day in-hospital mortality than patients in rural areas. Patients in urban areas also have a better overall survival chance than patients in rural areas.[6]

Limited resources in rural hospitals limit cardiologists options for treating acute myocardial infarction patients. If patients cannot obtain timely care from a specialist, they will seek care from a general doctor, who might not order necessary tests and cardiology referrals.[7] Finally, the care received in the pre-hospital settings in rural areas may not be adequate, because many long-distance EMS transport and most ambulance systems in rural areas are staffed by local less trained personnel who might not be trained enough to provide advanced cardiac life support interventions[8]

Pakistan is an agricultural country with 65% of population residing in rural areas. Although basic health units and rural health centers are located in every area, the standard of cardiac care is not much strengthened there. Usually general physician or a medical officer see patients initially. Due to lack of coronary care unit, intensive care unit, cardiac catheterization facility, shortage of cardiac medications, and availability of dedicated cardiac team 24 hours a day lead to referral of cardiac patients to urban centers after initial management. Our study highlights that, as acute myocardial infarction is more prevalent in rural as compared to urban areas, the new cardiac care facilities should be constituted in rural areas.

There can be many possible causes of rural dominance of acute myocardial infarction. As study done in Nabraska has showed, our study showes that conventional risk factors are more common in urban areas. So there are other factors responsible for the AMI in urban areas, like less developed health care facilities resulting in decreased early detection and treatment, less awareness of people about taking healthy life style measures, and probably most important is non adherence of medical treatment if diagnosed with cardiac disease. This study contrary to popular belief showed that, shows that acute myocardial infarction is more prevalent in urban areas. It also highlights many factors responsible for this high prevalence of acute myocardial infarction in rural areas. Similarly outcomes of acute myocardial infarction are also more worse in rural population as clearly shown in this study. It also highlights the factors responsible for the worse outcomes of acute myocardial infarction patient population in less developed rural areas in this local population. Data from a large, diverse, community-based population show a significant decrease in the incidence of myocardial infarction after 2000 and a dramatic decrease in the incidence of ST-segment elevation myocardial infarction throughout the past decade. [12] The overall adjusted case fatality rate has decreased over time, although it has not decreased among patients with ST-segment elevation myocardial infarctions. This study published showed the decreased overall incidence of acute myocardial infarction. We can deduce that urbanization is parallel with this decrease in incidence of acute myocardial infarction. Increasing emphasis has been put on measures to reduce risk factors at the individual and community levels, including public bans on smoking and lower target levels of low-density lipoprotein (LDL) cholesterol and blood pressure; these changes have resulted in improved control of risk factors over time. Improvements in medical care in rural areas might be expected to reduce the incidence of myocardial infarction, countervailing trends such as the increasing prevalence of obesity and diabetes could have the opposite effect in urban population. [12] Behavioral interventions (a healthy diet, increased physical activity, and smoking cessation) after AMI are known to be associated with a substantially lower risk of recurrent cardiovascular events.[9] Rural Nebraskans are less physically active, more obese, and use more tobacco products than their urban peers.[10,11] We also found that smoking is more prevalent in urban areas and less prevalent in rural areas. This paradox might be explained by urbanization of rural people. Perception of risks may also play a role in the rural–urban disparity for heart disease. Some rural inhabitants do not perceive themselves to be at risk for heart disease and stroke, and their behaviors are modeled by these misperceptions. So it results in high prevalence of heart disease in rural areas and this is what we have found in our study as well.

A Cross sectional study was carried out in a Cardiac institute of Ghana in June 2013. Data was collected by Questionnaires, interviews and observation. During the interviews from 60 outdoor patients, 20 patients were from rural population. The observed 40 patients (80%) of patients were from rural population and were smokers and were suffering from anterior wall MI. and only 20% patients were from urban population. A same type of descriptive cross-sectional study was carried out among two secondary school students Johr Bahru, Johr, Malaysia in March, 13, 2012. Data was collected by questionnaires & interviews. 339 students & Study showed that knowledge and practice among school student were satisfactory. The ECG study was performed and 65% of students were from rural population and were suffering from stress and episodic chest pain. People education about risk factors of coronary artery disease in rural areas is very important. Lack of this basic knowledge leads to uncontrolled risk factors and high prevalence of AMI in rural areas. This high prevalence in areas with less developed infrastructure and decreased literacy rate results in late perception of symptoms of chest pain of acute myocardial infarction. This all results in their late arrival to a nearby health facility which again is deficient in trained health personal and resources. So timely referral to a center where revscularization could be initiated is delayed. These areas are important to identify so that all steps of referral could be addressed. Some rural inhabitants do not perceive themselves to be at risk for heart disease and stroke, and their behaviors are modeled by these misperceptions. This lower perceived risk is exacerbated by the decreased availability of screening services in rural areas. Cardiac rehabilitation is also associated with reduced mortality, a finding that has previously not been reported at the population level. We found that AMI patients who attended a cardiac rehabilitation

session had a significantly reduced chance of mortality than patients with no cardiac rehabilitation. . Our study by knowing the distribution of prevalence of acute myocardial infarction in urban rural areas help to highlight or focus those areas where health infra structure needs to be developed.

CONCLUSION: Most of the patients with acute myocardial infarction were from rural areas. Most of them were old males and smokers. Lack of knowledge regarding the risk factors of AMI was an important factor in patients from rural areas.

LIMITATIONS: There are some limitations to our study. First, we did not account for case severity and treatment variation between rural and urban patients. Second we did not have data on the frequency of cardiac rehabilitation. Thirdly, study population is sometimes heterogeneous with regard to close proximity of rural areas with cities

REFERENCES:

1. O'Connor A., Wellenius G. Rural–urban disparities in the prevalence of diabetes and coronary heart disease. Public Health. 2012; Oct;126:813–820. [PubMed] [Google Scholar]
2. Baldwin L.M., MacLehose R.F., Hart L.G., Beaver S.K., Every N., Chan L. Quality of care for acute myocardial infarction in rural and urban US hospitals. J Rural Health. 2004; Spring;20:99–108. [PubMed] [Google Scholar]
3. Sheikh K., Bullock C. Urban-rural differences in the quality of care for medicare patients with acute myocardial infarction. Arch Intern Med. 2001; Mar 12;161:737–743. [PubMed] [Google Scholar]
4. Spertus J.A., Radford M.J., Every N.R. Challenges and opportunities in quantifying the quality of care for acute myocardial infarction: summary from the Acute Myocardial Infarction Working Group of the American Heart Association/American College of Cardiology First Scientific Forum on Quality of Care and Outcomes Research in Cardiovascular Disease and Stroke. J Am Coll Cardiol. 2003; May 7;41:1653–1663. [PubMed] [Google Scholar]
5. Ellerbeck E.F., Bhimaraj A., Perpich D. Organization of care for acute myocardial infarction in rural and urban hospitals in Kansas. J Rural Health. 2004; Fall;20:363–367. [PubMed] [Google Scholar]
6. Bhuyan SD, Wang Y, Opoku S, and Lin G. Rural–urban differences in acute myocardial infarction mortality: Evidence from Nebraska. J Cardiovasc Dis Res. 2013 Dec; 4(4): 209–213.
7. Witt B.J., Jacobsen S.J., Weston S.A. Cardiac rehabilitation after myocardial infarction in the community. J Am Coll Cardiol. 2004; Sep 1;44:988–996. [PubMed] [Google Scholar]
8. 18. Ellerbeck E.F., Bhimaraj A., Perpich D. Organization of care for acute myocardial infarction in rural and urban hospitals in Kansas. J Rural Health. 2004; Fall;20:363–367. [PubMed] [Google Scholar]
9. Chow C.K., Jolly S., Rao-Melacini P., Fox K.A., Anand S.S., Yusuf S. Association of diet, exercise, and smoking modification with risk of early cardiovascular events after acute coronary syndromes. Circulation. 2010; Feb 16;121:750–758. [PubMed] [Google Scholar]
10. Wang H., Mueller K., Xu L. Nebraska Health Information Project – Health Data Reporter; 2008. Health and Health-related Behaviors in Nebraska: Overall Trends, Progress towards Healthy People 2010 Goals, and Rural–Urban Comparisons. [Google Scholar]
11. The Nebraska Rural Health Plan. The Medicare Rural Hospital, Flexibility Steering Committee. Office of Rural Health Department of Health and Human Services; 2008. [Google Scholar]
12. WY Robert, S Stephen, C Mailini et al. Population trends in incidence and outcomes of acute myocardial infarction. Engl J Med 2010; 362:2155-2165