COST COMPARISON STUDY BETWEEN A PRIVATE SECTOR AND A PUBLIC SECTOR HOSPITAL IN PESHAWAR, KHYBER PAKHTUNKHWA, PAKISTAN FOR MYOCARDIAL INFARCTION PATIENTS

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ABSTRACT

OBJECTIVE: To determine cost comparison of private sector hospital; North West General Hospital (NWGH) and public sector hospital; Hayat Abad Medical Complex (HMC), for myocardial infarction (MI) patients.

METHODS: The demographic data of the patients suffering from MI were collected from NWGH and HMC Hospital and Research Center Peshawar, Khyber Pakhtunkhwa Pakistan. Frequency of MI patients were calculated from patients suffering from cardiovascular disease (CVD), total direct medical costs were calculated, average hospital stay as well as the Willingness to pay were also determine.

RESULTS: Out of total 667 Cardiovascular disease (CVD) patients 241 patients were suffering from MI. Out of total 241 MI patients from both hospitals, 74 (30.71%) get treatment from NWGH and 167 (69.29%) get treatment from HMC. Average hospital stay of MI patients in HMC is 3.23 days and in NWGH is 1.63 days. Total average MI medical related cost in HMC is Pakistani Rupees (Rs.) 23650 and NWGH is Rs. 280425. Out of total 241 MI patients, 36.93% and 85.89% cannot bear the expenses of myocardial infarction related costs of HMC and NWGH respectively

CONCLUSION: High Cost, low rate of hospitalization, lesser average hospital stay and larger number of patients who cannot bear the expenses of NWGH indicates that NWGH is expensive and not affordable for major population of KPK suffering from MI.

KEY WORDS: Myocardial infarction (MeSH), Costs and Cost Analysis (MeSH), Length of Stay (MeSH)

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INTRODUCTION

Myocardial infarction (MI) or heart attack is one of the life threatening situation develops due to sustained ischemia because of reduced blood supply to local area of myocardium resulting in local necrosis of myocardium.[1] MI could be predictable from chest pain, shortness of breath (SOB), ECG findings, elevated level of biomarkers and angiography.[2] If not treated early it may produce severe health complications. MI complications lead to stroke, heart failure, subsequent MI, psychological complications and death. The various risk factors for MI are hypertension, smoking, high cholesterol level, obesity, alcohol and family history.[3] In US, about 320,000 recurrent and 6000,000 new MI report each year leading to 696000 hospital stay, charged at $31 billion.[4] In Pakistan, disease burden of ischemic heart disease (IHD) is 5,09,375 patients[5] and is the second most common cause of death.[6] In 2020, it will be the top cause of death.[7] Prevalence of MI is 11%[8] and is more common in males than females in the local population of Pakistan.[9] Mortality due to MI has decreased up to 30% since last twenty years in developed countries,[10] but it is still high in underdeveloped countries such as Indian subcontinent including Pakistan.[11]

Due to increased burden of cardiovascular diseases (CVD) and scarce financial resources the financial burden is increasing on society.[12,13] Pharmaco-economics provide effective mean to cope with these challenges. Through this, not only economical but more effective intervention is adapted.[14] For this purpose incremental cost effectiveness ratio is calculated in order to adapt more effective and less costly intervention. But if the intervention is much effective and the people are not able to pay for such intervention than this intervention is not cost effective.[15] Therefore, each

TABLE 1: FREQUENCY OF PATIENTS ADMITTED TO HMC AND NWGH DURING JANUARY AND FEBRUARY, 2014

Hospital	Patients with Myocardial Infarction (MI)		Patients with cardiovascular diseases other than MI		Total (n=667)	
	Frequency	%age	Frequency	%age	Frequency	%age
HMC#	167	34.9%	311	65.1%	478	71.66%
NWGH$	74	39.2%	115	60.8%	189	28.34%
Total	241	36.1%	426	63.9%	667	100%

#: Hayatabad Medical Complex; $: North West General Hospital

TABLE II: COMPARATIVE COST OF PATIENT AT HMC AND NWGH

Types of charges	NWGH#		HMC$	
	Cost limit	Average costs	Cost limit	Average costs
Drug acquisition	Rs. 800-1500/ day	1150	Rs.800-1500/ day	1150
Doctor fee	Rs. 500-2000	1250	Rs. 0	0
Angiography	Rs. 20000-30000	25000	Rs. 4000	4000
Angioplasty	Rs. 120000-300000	210000	Rs. 15000	15000
Lab investigation	Rs. 5000-10000	75000	Rs. 2000-5000	3500
Services	Rs. 50-1000	525	Rs. 0	0
Ward (Daily)	Rs. 3500-5000	4250	Rs. 0	0
CCU (Daily)	Rs. 6500	6500	Rs. 0	0
Other	Rs. 10000-30000	20000	Rs. 0	0
Estimated total cost on MI	Rs. 166350-394500	280425	Rs. 21800- 25500	23650
Net cost (Pakistani Rupees)	280425 – 23650 = 256775			

$: Hayat Abad Medical Complex; #North West General Hospital

intervention has its own threshold (willingness to pay), above which, the intervention is considered as not cost effective. Willingness to pay or incremental cost effectiveness threshold depends on several factors including socioeconomic condition of the society. WHO considers an intervention to be cost effective if that intervention costs less than GDP per capita of a particular country.[16]

As there are no local studies available on cost comparison of public and private hospitals for treatment of MI patient, this study was conducted to determine cost comparison of private sector hospital; North West General Hospital (NWGH) and public sector hospital; Hayat Abad Medical Complex (HMC), for MI patients.

METHODS

This study was conducted in the month of January and February 2014, in North West General Hospital and Research Center Peshawar, Pakistan and Hayatabad Medical Complex, Peshawar Khyber Pakhtunkhwa, Pakistan. All patients who were hospitalized in both hospitals cardiac care units were analyzed. Written permission of hospital administration was taken to use the hospital data for research publication. The demographic data of those patients were obtained, who were diagnosed positive for MI or other CVDs, on the basis of ECG finding, biomarkers and electrocardiography. All direct cost were calculated

TABLE III: NUMBER OF MYOCARDIAL INFARCTION (MI) PATIENTS WILLING TO PAY HOSPITAL EXPENSES

Types	MI Patients at HMC#		MI Patients at NWGH$		Of total 241 MI Patients			
					Expenses of NWGH$		Expenses of HMC#	
	Frequency	%age	Frequency	%age	Frequency	%age	Frequency	%age
Willing to pay	78	46.71	34	45.94	34	14.11	152	63.07
Not willing to pay	89	53.29	40	54.05	207	85.89	89	36.93
Total	167	100	74	100	241	100	241	100

:Hayat Abad Medical Complex; $:North West General Hospital

including doctor fee, drug acquisition cost, services charges, hospital related cost such as daily charges for CCU and cardiology ward, angiography, angioplasty and other medical related costs. A questioner, comprising questions related to willingness to pay including a face to face interview, was prepared. Length of stay in both hospitals was calculated from the day of admission to the day of discharge. All data was obtained with the previous consent of patients.

RESULTS

This study was conducted in the month of January and February 2014 in North West General Hospital & Research Center and Hayatabad Medical Complex, Peshawar, Khyber PakhtunKhwa, Pakistan.

A total 667 CVD patients were hospitalized in HMC and NWGH in the month of January and February 2014. Out of total 667 patients, 241 (36.13%) were suffering from MI. Of the total 241 MI patients, 167 (69.29%) patients received treatment from HMC and 74 (30.71%) got treatment from NWGH. Out of 667 patients, 214 (36.13%) were suffering from MI and 426 (63.87%) were suffering from other cardiovascular diseases (CVD) such as angina, heart failure etc, as shown in Table 1.

Out of total 667 CVD patients 478 (71.66%) got treatment from HMC and 189 (28.34%) got treatment from NWGH. Average stay of MI patients in HMC and in NWGH was 3.32 and 1.63 days, respectively.

Table II shows direct cost associated with MI. Total average cost at NWGH was Rs. 2,80,425 which included drug acquisition Rs. 1150, doctor fee Rs. 1250, angiography Rs. 2500, angioplasty Rs. 21000, lab investigation Rs. 7500, services Rs. 525, ward (daily) Rs. 4350, CCU (daily) Rs. 6500 and other Rs. 20,000. Whereas, average cost at HMC was much affordable as it is a public sector hospital and the doctor fee, services charges and other related medical related costs are not charged at patient's pockets. Average costs of drugs were Rs. 1150, angiography Rs. 400, angioplasty Rs. 15000 and lab investigations were Rs. 3500.

Table III shows willingness to pay. Out of total 167 MI patients at HMC,78 (46.71%) were willing to pay, while in NWGH, 34 (45.94%) were willing to pay. Combining total data of MI patients from both hospitals, 34(14.11%) patient were willing to pay expenses of NWGH while 152 (63.07%) were willing to pay expenses of HMC.

DISCUSSION

This result of this study shows that more patients get treatment from HMC than NWGH. Dhalla et al., has analyzed that if burden of cost comes on patient than adherence to that treatment reduces as compared to those patients who are paid by government or third party. This adherence to medication improves quality of life and also reduces mortality. He claimed that if 1% price increases, 0.16% adherence to that treatment decreases.[17] This is the reason that due to high costs of NWGH and low socioeconomic condition of majority of the people living in Khyber Pakhtunkhwa, patients adherence or getting treatment from NWGH is much more less due to its high cost as compared to HMC, where more patients get treatment because this is a government hospital. Only the medication charges are paid by patients in government hospital in Pakistan, other costs are paid by government.

Average patient stay in both hospitals/ Average stay of MI patients is higher in HMC (3.23 days)compared to that of NWGH (1.63 days). Desideri et al has showed that patients who have uncomplicated MI by early discharge the cost of hospitalization reduce, although minor complications produce due to early discharge. The normal time of discharge for those patients who have uncomplicated MI are 3-4 days.[18] But the normal average stay is shorter in NWGH due to its high costs and patients are put on home treatment after early discharge. Though most of patients are willing to stay in NWGH in order to prevent any upcoming complications due to MI, but due to its high cost they soon leave hospitals (discharged) in order to avoid further hospital costs.

Table II shows costs of both hospitals. The average cost of NWGH is much higher than HMC. As HMC is public sector hospital therefore service charges, doctor fee, hospital charges including ward and other medical related costs are not pay by patients. Average cost bearing by patients at HMC (Rs. 23650) is much lower than average cost at NWGH (Rs. 280425). This cost includes drug acquisition, doctor fee, angiography, angioplasty, lab investigation, services, ward, CCU, and other medical related costs. Willingness to pay from table III shows that 46.71% of patients at HMC were willing to pay the expenses of HMC and in NWGH about 45.94% MI patients were willing to pay the expenses of NWGH. Taking total 241 MI patients, 85.89% were not willing to pay the expenses of NWGH, while only 36.93% were not willing to pay the expenses of HMC.

This shows that NWGH is much more expensive for the general patients suffering from MI and majority are not willing to pay the expenses of NWGH.

CONCLUSION

The lower rate of patient's hospitalization, high cost, lesser stay in hospital and larger number of patients who are not willing to pay the expenses of NWGH indicates that NWGH is not cost friendly and affordable for the MI patients in KPK Pakistan, where majority of the people has a low socioeconomic condition.

REFERENCES

1. Ziauddin, Ali N, Sultan U,Haq Z. Pharmacotherapeutic study of myocardial infarction. Can J App Sci 2012;2(1): 233-39.
2. Thygesen K, Alpert JS, Jaffe AS, Simoons ML, Chaitman BR, White HD. Third universal definition of myocardial infarction. Eur Heart J 2012;33: 2551–67.
3. Zareef S, Jamil M, Baqai HZ, Syed NM. Frequency of various Risk Factors among Patients with Myocardial Infarction. Ann Pak Inst Med Sci 2009;5(3): 193-96.
4. Shah I, Faheem M, Khan A, Jan H, Hafizullah M. Hospital outcomes of ST-elevated myocardial infarction in patients with and without hypertension. J Med Sci 2012;20(4): 159-64.
5. Abbas S, Kitchlew AR, Abbas S. Disease Burden of Ischemic Heart Disease in Pakistan and its Risk Factors. Ann Pak Inst Med Sci 2009;5(3): 145-50.
6. Ashraf A, Ashraf S. Conventional cardiovascular risk factors associated with acute coronary syndrome in female patients admitted in Cardiology Departments Khyber Teaching Hospital, Peshawar. Khyber Med Uinv J 2012;4(2): 64-69.
7. Javaid A, Abid AR, Rizvi FH, Ahmad I. In hospital outcome of patients with acute ST- elevated myocardial infarction requiring temporary transvenous pacing. J Shiekh Zayed Med Coll 2011; 2(4): 217-23.
8. Ikramullah, Ali J, Faheem M, Qureshi S, Shah SFA, Khan SA, Hafizullah M. Frequency of complete heart block and in-hospital mortility in patiets with acute interior wall infarction. Pak Heart J 2012;45 (04): 249–55.
9. Shabbir M, Azhar M, Kayani AM, Qureshi O, Mughal MM. Predictors of fatal outcomes in acute myocardial infarction. J Ayub Med Coll Abbottabad 2008;20(3): 14-16.
10. Jaffery MH, Shaikh K, Baloch GH, Shah SZA. Acute myocardial infarction. Professional Med J 2014,21(2): 258-63.
11. Goyal A, Yusuf S. The burden of cardiovascular disease in the Indian subcontinent. Indian J Med Res 2006; 124: 235-44.
12. Bramkamp M, Radovanovic D, Erne P, Szucs TD. Determinants of Costs and the Length of Stay in Acute Coronary Syndromes: A Real Life Analysis of More Than 10,000 Patients. Cardiovasc Drugs Ther 2007; 21(5):389-98. DOI 10.1007/s10557-007-6044-0
13. Tang JL, Wang WZ, An JG, Hu YH, Cheng SH, Griffiths S. How willing are the public to pay for anti-hypertensive drugs for primary prevention of cardiovascular disease: a survey in a Chinese city. Internat J Epidemioly 2009; 1–11.
14. Gattani SG, Patil AB, Kushare SS. Pharmacoeconomics: A review. Asian J Pharm Clin Res 2009; 3(2): 15-26.
15. Shiroiwa T, Sung YK, Fukuda T, Lang HC, Bae SC, Tsutani K. International survey on willingness to pay (WTP) for one additional QALY Gained: What is the threshould of cost effectiveness?, Health Eonomics. Health Econ 2010; 19: 422-37.
16. Thavorncharoensap M, Teerawattananon Y, Natanant S, Kulpeng W, Yothasamut J, Werayingyong P. Estimating the willingness to pay for a quality-adjusted life year in Thailand: does the context of health gain matter? Clinicoecon Outcomes Res 2013; 5: 29–36.
17. Dhalla IA, Smith MA, Choudrey NK, Denburge AE. Costs and benefits of free medication after myocardial infarction. Health Care Policy, 2009; 5(2), 68-86.
18. Desideria A, Fiorettib PM, Cortigianic L, Gregorid D, Colettae C, Vignaf C, et al. Cost of strategies after myocardial infarction (COSTAMI). Eur Heart J 2003; 24, 1630-1639.

AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

BA: Concept & study design, acquisition of data, final approval of the version to be published

AB & ZU: Acquisition of data, drafting the manuscript, final approval of the version to be published

AK: Critical revision, drafting the manuscript, final approval of the version to be published

SA & SUR: Drafting the manuscript, final approval of the version to be published

NA: Analysis & interpretation of data, final approval of the version to be published

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

CONFLICT OF INTEREST

Authors declare no conflict of interest

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