

Medication Adherence After CABG and its Related to Medication Belief

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ABSTRACT

Patients think their illness cured after coronary artery bypass grafting (CABG) completely but it is noticeable this therapeutic method can decrease the signs and symptoms of disease but can't cure it. By the way non medication adherent patients are high risk group for health delivery systems, and this situation may lead to increase admitting in hospitals and even lead to death. It seems the belief toward medication can affect on medication adherence. The samples of this of this cross sectional study were 217 patients six months after CABG surgery who selected by systematic randomized sampling. They participated in study by answering to a questionnaire that consisted of three sections about sociodemographic data, medication belief and adherence. Data gathering was done by phone calling. Data analysis was done by SPSS software version 16, by the use of descriptive and inferential statistics such as Chi square and Mann Whitney tests as appropriate. Results showed the majority of samples had higher beliefs toward medication in specific necessity (62.7%), specific concerns (61.8%), general harm (56.2%) and general overuse (56.7%). In addition medication belief in majority of samples (56.2%) was desire and medication adherence was better than, and 81.1% of samples medication adherence was desire but relationship between medication beliefs and adherence was not significant. The drug belief was undesired in some of patients who had desire medication adherence. This point may indicate on other influenced factors on medication adherence and we offer to investigate in future studies.

Key words: Medication adherence, Patient belief, Coronary artery bypass.

INTRODUCTION

Coronary artery disease is a common disease and a life threatening health condition in our world^{1,2}. In recent decades it is the most reason of death in Iran³. Based on WHO reports, coronary artery disease was the cause of 41.3% of all death in Iran in 2005, and it is anticipated to reach to 44.8% in 2030⁴. Coronary artery bypass grafting (CABG) is the most common invasive therapeutic method for curing of this disease⁵. In Iran 30000 open heart surgery is done annually in different centers that the most of them is CABG. Based on report of heart center in Tehran –the capital of Iran– annual 3000 CABG is done in this center⁶.

Unfortunately some of patients after CABG think their illness cured completely⁷ but it is noticeable this therapeutic method can decrease the sign and symptom of disease but can't cure it^{3,7}. Furthermore the chance of danger is continued⁸. The size of this problem and its potential impact on patients health cause the importance of patient encourage to adherence their drug regimen^{7,8}. Drug regimen after CABG may consisted of anticoagulation drugs, Beta blockers, ACE inhibitors and statins^{9,10}. Cardiac event after CABG decrease by using of these drugs that act based on second prevention level^{8,10}. The result of Goyal et al study showed significant associated between drug adherence and good outcome in 2 years after CABG ($p=0.01$). By the

way in 2 years after CABG, non adherent clients versus adherents had twice step possible danger of MI or death¹⁰. In spite of these results, many of studies showed drug adherence after CABG is week^{8,9,10,11}. Based on finding of these studies about 50% of patients don't adhere their prescribed drug regimen after CABG^{12,13}. It is important that non adherent patients are dangerous point for health delivery systems, because non adherents patients need more caring and sign and symptoms of their situation may lead to increase admitting in hospitals and even lead to death¹². So doing more studies about adherence related factors seems necessary¹⁴.

In many of studies showed different factors related to drug adherence after CABG, but it seems patient beliefs about medicine is an important factor related to drug adherence after CABG^{12,13,19,20,21,22}. Correct usage of drugs is related to patients believe and attitude about drugs and their effects on health²³, so positive drug belief about drug efficacy may be improve drug adherence^{12,17,18,19,26}. In spite of significant associated between positive drug belief and drug adherence, the finding of some of studies showed no significant relationship between these variables⁸. It seems culture and socio demographic variables can affect on drug belief and adherence and this issue can obvious the necessity of this study. The aim of this study was to determine relationship between medication belief and adherence 6 months after CABG.

MATERIALS AND METHODS

The population of this cross sectional study consisted of patients who had history of coronary artery surgery at least 6 months before our study. Inclusion criteria were absence of psychiatric disease on base of the history of patient's documents in hospital, ability to speak in Persian and had once coronary artery surgery. The samples of this study were 217 patients who selected by systematic randomized sampling. The result of Nahapetian study's about drug regimen adherence was used for detection of this study's sample size⁸. The tool of study was a questionnaire that consisted of 3 sections. The first section planned for patients socio demographic data. Information regarding comorbid conditions was obtained from patients'

medical chart, the second section consisted of 18 phrases about beliefs about medications. This phrases was obtained of Horne et al study²⁷ which used by Nahapetian⁸ too. Each phrase has answer by lickert spectrum from strongly disagreement¹ to strongly agreement⁵. This tool has two sections about general and specific domains. General domain has two section consisted of general harm and general overuse, and specific domain has two section consisted of specific necessity and specific concerns. Mean belief score was created based on the scores of belief towards medication questionnaire questions. The lower the mean score is the higher beliefs towards medication. The adherence to medication measured by Morisky medication adherence scale. This scale have 4 phrases about medication adherence and achieving the lower score of this scale means the better adherence to medication⁸. For detecting of validity and reliability of belief and adherence to medication, at first step all of those translate to Persian and retranslated to English by an English language expert, after the Persian version sent to expert panel that consisted of 12 nursing experts. They filled CVR and CVI form for these tools and all of phrases achieved more than 80% of score. After that in a pilot study 13 questionnaire were filled by patients. Alpha value for belief towards medication was 0.78. Then, after 2 week these patients filled questionnaire and correlation between two step for medication belief domains (specific necessity, specific concern, general harm and general overuse) was in order 90.84, 99.37, 93.09 and 90.67. This value for adherence to medication scale was 93.46.

Data gathering was done by phone calling. Even though the center of finding of patient don't have rehabilitation system after cardiac surgery, only refinding of such patients use of phone calling. On enrollment all patients were informed of study objectives and their rights if they decide to join the study. Before starting of gathering data, ethical approval was obtained from Ethics Committee of Guilan University of Medical Science. For systematic randomized sampling, the phone number of patients who at least 6 months passed of their surgery were found. By the way 453 phone number were chosen, 208 patients of them didn't answer to calling, 10 patients died, 11 patients were disoriented, 5

patients couldn't speak to Persian and 2 patients admitted in hospital. Finally after verbal satisfaction 217 patients participated in study. Gathering data was done from May to June 2013.

Data analysis was done by SPSS software version 16, by the use of descriptive and inferential statistics such as Chi square and Mann Whitney tests as appropriate. P value of <0.05 were considered statistically significant.

RESULT

The finding of this result showed the mean age of samples was 58.70 ± 9.46 and the mean time after their surgery was 9.71 ± 2.12 months and this time for majority of samples (55.3%) was more than 9 months. Table 1 gives the baseline characteristics of all samples in our study.

Result showed medication belief in majority of samples (56.2%) was desire and about medication adherence results showed 81.1% of samples adherence was desire. Kolmogorov-Smirnov test showed the medication drug score didn't have normal distribution in due use of Mann Whitney test showed relationship between medication beliefs and adherence was not significant, although the medication beliefs of the majority of samples who had good medication adherence was desire (table 2).

In addition chi square test showed significant relationship between adherence to medication and age ($P < 0.008$), marital status ($P < 0.02$), educational attainment ($P < 0.0001$), familial history of heart disease ($P < 0.01$), other disease history ($P < 0.008$), job ($P < 0.001$), income ($P < 0.03$), residence area ($P < 0.007$). About four parts of beliefs towards medication, result showed the majority of samples had higher beliefs toward medication in specific necessity (62.7%), specific concerns (61.8%), general harm (56.2%) and general overuse (56.7%).

DISCUSSION

The belief towards medication in the most of samples was good. This finding is similar the finding of a study in Armenia about medication

beliefs and adherence after CABG⁸. Many of findings of research emphasize on effect of medication beliefs on correct use of drugs and patients participation in self-care and adherence^{12, 17, 18, 19, 26, 28}. It seems, deep belief about beneficially and effectiveness of drugs on quality of life promotion after CABG, can cause to increase adherence to medication. By the way higher rates of medication adherence were associated with lower rates of hospitalization and a reduction in total medical costs among people who have CABG history. Maybe a part of this belief was achieved by educational program that was thought by health care workers in hospitalized time before and after surgery. Unfortunately our patients do not have rehabilitation program after discharge of hospital in our research setting. It is possible patients perceived coronary artery bypass grafting cannot solve their problems absolutely. By the way it is necessary to make changes in their life style. As a result of non-adherence patients do not get an appropriate benefit from surgical treatment^{3, 7}. The level of knowledge about disease and its therapeutic style and educational level can affect on beliefs toward medication and medication adherence. In our study majority of samples were literate and this character may be influence on their beliefs and adherence. It is noticeable the finding of many of studies emphasized on relationship between medication beliefs and adherence but in our study this relationship is not significant. Many of factors can influence this finding such as the time of gathering data. The mean of time after surgery in our samples about 9 months and it is possible, this duration was not enough for forming complete beliefs toward medication, but may be most of patients at that time remembered their problems in hospital and surgery memory yet, then they obligated themselves to medication adherence. However our finding about desire adherence is similar to many of studies⁹. In addition this finding is similar to many of studies that their patient's adherence was not complete²⁹. The finding of this study showed significant relationship between age and medication adherence and older patients had better adherence. Similar to this finding was achieved in Khanderia *et al's* study⁹ of course in some of studies this relationship wasn't significant³⁰. It seems increasing the age can cause increase experiences and older patients probably know good

Table1: Distribution of subjects according to demographic factors

Frequency		Frequency	percent
Characteristics			
Age	≤44	16	7.4
	44 - 64	143	65.9
	65≥	58	26.7
	Mean±SD	9.46±58.7	
Gender	male	133	61.3
	female	84	38.7
Marital Status	Single	36	16.6
	Married	181	83.4
Education Attainment	Illiterate	84	38.7
	following diploma	96	44.2
	Diploma and above	37	17.1
Familial History Of Heart Disease	yes	107	49.3
	no	110	50.7
History Of High Blood Pressure Disease	yes	76	35
	no	141	65
History Of Other Disease	yes	92	42.4
	no	125	57.6
Time Of Operation Living Conditions	9 month≤	97	44.7
	9 month>	120	55.3
	Mean±SD	12.2±71.9	
	Alone	12	5.5
	with spouse	58	26.7
	with spouse and children	123	56.7
Job	With children	24	11.1
	Retired	53	24.4
	worker	25	11.5
	Employee	11	5.1
	Self-employed housewife	54	24.9
Residence Area	city	74	34.1
	Village	135	62.2
Income		82	37.8
	<500000	134	61.8
	-1000000	67	30.9
	500000 ≥1000000	16	7.4

adherence can prevent of complications and reduce medical cost, so to try adherence. In addition aging cause increase responsibility and the majority of our samples had more than 45 years old.

One of impressive finding of this study was better medication adherence in low education level than high education attainment and relationship between these variables was significant. It is noticeable the majority of our samples did not have academic education in universities and this issue can influence our findings. Maybe patient with low level education possibility know about their low knowledge about self-care, so trying to medication adherence and act base on issues that were thought them in hospital. Our finding is not similar to some of other studies^{30, 31, 32}. Because in many of studies good adherence associated by good knowledge and our finding about this variable is similar only to the finding of Melloni *et al*'s study³³.

Familial history of heart disease was the one of variables that had significant relation with medication adherence. Observation of other family member and knowing their therapeutic situation may be affected on patients medication adherence. Similar this finding achieved about patients 'other diseases history that had significant relationship with adherence. This finding is similar to finding of some studies³⁴ and isn't similar to finding of other studies^{28, 35}. It seems comorbidity of some disease cause complexity of drug regimen and applying of some different drug can affect on desire adherence.

Job is one of variables that influenced on medication adherence in our study. It is similar to some finding³⁶ and isn't similar to other findings³⁷. In our study workers had better adherence than other jobs. Workers income usually is lower and maybe, workers try to good adherence for prevention of increasing cost. The majority of our samples had low income too.

It is noticeable the drug belief was undesired in some of patients who had desire medication adherence. This point may indicate on other influenced factors on medication adherence and we offer to investigate in future studies. Our study was done for patients who had at least six

Table 2: Distribution of drug adherence based on the medication belief

Medication adherence Medication belief	desired		Undesired		P value
	frequency	percent	frequency	percent	
desired	102	83.6	20	16.4	P= 0.287
undesired	74	77.9	21	22.1	

months since surgery at the time of the data collection and it may be need to long time for formation of desire belief about drugs effect.

This study was done in a setting without rehabilitation after CABG; these findings can help to plan a wide rehabilitation program for these patients. By the way we will expect to help improving quality of life and life style of patients.

Self-reported information regarding beliefs toward medication and medication adherence is subject to report bias and it is our major limitation. We did not have our patients in follow up and had to call them by phone and this gathering data method may affect on our findings.

CONCLUSION

The drug belief was undesired in some of patients who had desire medication adherence. This point may indicate on other influenced factors on medication adherence and we offer to investigate in future studies.

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REFERENCES

- Jamshidi N, Abbaszadeh A, Najafi Kalyani M. Comparison of Video & Verbal Education on Satisfaction and Post-Operative Complications of Patients Undergoing Coronary Angiography. *Journal of Fasa University of Medical Sciences.*; 4(1):178-182 (2012). [In Persian]
- Shahsavari H, Shahriari M, Alimohammadi N. Motivational factors of adherence to cardiac Rehabilitation. *Iranian Journal of Nursing and Midwifery Research.* 17(4):318-324 (2012).
- Sadeghi Sharmeh M, Razmjoie N, Ebadi A, Najafi Mehri S, Asadi Lari M, Bozorgzad P. Effect of continuous care model on quality of life in patients after Coronary Artery Bypass Surgery. *Journal of critical care nursing.* ; 2(1):1-6 (2010). [In Persian].
- Shahraki Vahed A, Hamedi Shahraki S, Masinaienezhad N, Badakhsh M. A survey of the educational needs of the relatives of the patients with cardiovascular diseases. *Journal of Jahrom University of Medical Sciences;* 9(2):41-47 (2011). [In Persian].
- Cebeci F, Celik S. Discharge training and counseling increase self-care ability and reduce post discharge problem in CABG patient. *Journal of clinical nursing;* 17:412-420 (2008).
- Asadi Noghahi A, Shaban M, Faghihzade S, Asadi M. Effects of Phase 1 of a rehabilitation program On anxiety of candidates Patients for coronary bypass surgery. *Journal of Nursing and Midwifery, Tehran University of Medical Sciences (Hayat);* 14(3,4):5-13 (2009). [In Persian].
- Thomson P. complex factor that influence patient and partner and dyad outcome 4 month after CABG. Thesis for degree of doctor of philosophy. University of Stirling in Scotland, 2008.
- Nahapetyan A. Relationship between

- Patients' Knowledge about Post-Operative Risk Factors after Coronary Artery Bypass Surgery (CABG) and Adherence to Medication and Lifestyle Changes in Armenia .Thesis for degree of Master of Public Health .College of Health Sciences ,American University of Armenia Yerevan, Armenia, 2007.
9. Khanderia U, Townsend K, Erikson S, Vlasnik J, Prager R, Eagle K. Medication adherence following coronary artery bypass graft surgery : assessment of beliefs and attitudes. *Annals of Pharmacotherapy*; **42**(2):192-199 (2008). [Abstract]
 10. Goyal A, H. Alexander J, E. Hafley G, H. Graham S, H. Mehta R, J. Mack M, et al. Outcome associated with the use of secondary prevention medications after coronary artery bypass graft surgery. *The Annals of Thoracic Surgery*; **83**: 993-1001 (2007).
 11. Okrainec K, Pilote L, Platt R, J. Eisenberg M. Use of cardiovascular medical therapy among patients undergoing coronary artery bypass graft surgery: Results from the ROSETTA-CABG Registry. *Can J Cardiol*; **22**(10):841-847 (2006).
 12. Levesque A, Z. Li H, Pahal J. Factors related to patients adherence to medication and lifestyle change recommendations: data from Canada. *International journal of psychological studies*; **4**(2):42-51 (2012).
 13. Kulik A, Levin R, Ruel M, Mesana T, Solomon D, Choudhry N. Patterns and predictors of statin use after coronary bypass graft surgery. *The journal of Thoracic and Cardiovascular surgery*; **134**(4):932-8 (2007).
 14. Schüz B, Marx C, Wurm S, Ziegelmann JP, Schwarzer R, Tesch-Römer C. Medication beliefs predict medication adherence in older adults with multiple illnesses. *Journal of Psychosomatic Research.*; **70**: 179–187 (2011).
 15. Forster Held R. Affective distress moderates the relationship between treatment beliefs and adherence in chronic illness patients. A dissertation submitted to the Graduate School-New Brunswick Rutgers. The State University of New Jersey. 2011.
 16. Tuppin P, Neumann A, Danchin N, Peretti C, Weill A, Ricordeau P, Allemand H. Evidence-based pharmacotherapy after myocardial infarction in France: Adherence-associated factors and relationship with 30-month mortality and rehospitalization. *Archives of Cardiovascular Disease*; **103**:363—375 (2010).
 17. Jourgens M, Seekatz B, Moosdorf R, Petrie K, Rief W. Illness belief before cardiac surgery predict disability , quality of life , and depression 3 month later. *Journal of psychosomatic research*; **68**:553-560 (2010).
 18. Lin Y, Furze G, Spilsury K, Lewin R. Misconceived & maladaptive beliefs about heart disease ,comparison between Taiwan & British. *Journal of clinical nursing*; **18**: 46-55 (2008).
 19. Sirey J, Greenfield A, I. Weinberger M, L. Bruce M. Medication Beliefs and Self-Reported Adherence Among Community-Dwelling Older Adults. *Clinical Therapeutics*; **35**:153-160 (2013).
 20. HiraniSh, Newman S. Patients' beliefs about their cardiovascular disease. *Heart*; **91**:1235–1239 (2005).
 21. Horne R, Weinman J. Patients' beliefs about prescribed medicines and their role in adherence to treatment in chronic physical illness. *Journal of Psychosomatic Research.*; **47**(6):555–567 (1999).
 22. Riekert K, Drotar D. The Beliefs About Medication Scale: Development, Reliability, and Validity. *Journal of Clinical Psychology in Medical Settings.*; **9**(2):177-184 (2002).
 23. Minaiyan M, Taheri M, Mirmoghtadaee P, Marasi M. Comparative Role of Demographic Factors and Patient's Belief about Prescribed Medicine On Adherence to Drug Treatment in Chronic Diseases. *Journal of Isfahan Medical School*; **29**(156):1303-1311 (2011). [In Persian].
 24. Mahler C, Hermann K, Horne R, Jank S, Haefeli WE, Szecsenyi J. Patients belief about medicine a primary care setting in Germany. *Journal of evaluation in clinic practice.*; **18**: 409-413 (2012).
 25. Lapoint N, OU F, Calvert SB, Melloni C, Stafford JA, Harding T, et al .Changes in beliefs about medication during long term

- care for ischemic heart disease. *American heart journal*; **159**(4):561-569 (2010).
26. Percival M, Cottrell N, Jayasinghe R. Exploring the beliefs of heart failure patients towards their heartfailure medicines and self-care activities. *Int J Clin Pharm*; **34**:618–625 (2012).
 27. Horne R, Weinman J, Hankins M. The beliefs about medicines questionnaire: The development and evaluation of a new method for assessing the cognitive representation of medication. *Psychology and Health*. **14** (1):1–24 (1999). [Abstract].
 28. Lapoint N, Ou F, B. Calvert S, Melloni Ch, A. Stafford J, Harding T, et al. Association between patient beliefs and medication adherence following hospitalization for acute coronary syndrome. *American Heart Journal*. ; **161**(5):855-863 (2011).
 29. Looi K L, Chow K L, Looi J L, Lee M, Halliday S, White H. Under-use of secondary prevention medication in acute coronary syndrome patients treated with in-hospital coronary artery bypass graft surgery. *Journal of the New Zealand Medical Association*; **124**(1343):18-27 (2011).
 30. Melloni Ch, P. Alexander K, Ou F S, LaPointe N, T. Roe M, Newby L K & et al. Predictors of Early Discontinuation of Evidence-Based Medicine After Acute Coronary Syndrome. *The American Journal of Cardiology*; **104**:175-181 (2009).
 31. P. Kulkarni S, P. Alexander K, Lytle B, Heiss G, D. Peterson E, Chapel Hill D. Long-term adherence with cardiovascular drug regimens. *American Heart Journal*.; **151**(1):185-191 (2006).
 32. D. Reid R , I. Morrin L, L. Pipe A , A. Dafoe W, A.J. Higginson L, T. Wielgosz A , et al. Determinants of physical activity after hospitalization for coronary artery disease: the Tracking Exercise After Cardiac Hospitalization (TEACH) Study. *European Journal of Preventive Cardiology*; **13**(4):529-537 (2006). [Abstract]
 33. Mazzaglia G, Ambrosioni E, Alacqua M, Filippi A, Sessa E, Immordino V & et al. Adherence to antihypertensive medications and cardiovascular morbidity among newly diagnosed hypertensive patients. *Circulation*; **120**(16):1598-605 (2009).
 34. K. Choudhry N, Setoguchi S, Levin S, C. Winkelmayer W ,H. Shrank W. Trends in adherence to secondary prevention medications in elderly post-myocardial infarction patients. *Pharmacoepidemiol Drug Saf.* ; **17**(12):1189–1196 (2008).
 35. Farrell K, Shen B, Mallon S, J. Penedo F, H. Antoni M. Utility of the Millon Behavioral Medicine Diagnostic to Predict Medication Adherence in Patients Diagnosed with Heart Failure. *Journal of Clinical Psychology in Medical Settings*; **18**(1):1-12 (2011).
 36. Chiou A F, Wang H L, Chan P, Ding Y A, Hsu K L, Kao H L. Factors associated with behavior modification for cardiovascular risk factors in patients with coronary artery disease in Northern Taiwan. *Journal of Nursing Research*; **17**(3):221-230 (2009).
 37. P. Davis D, D. Jandrisevits M, Iles S, R. Weber T, C. Gallo L. Demographic, socioeconomic, and psychological factors related to medication non-adherence among emergency department patients. *The Journal of Emergency Medicine*; **43**(5):773–785 (2012).