ORIGINAL ARTICLE

Anxiety and Depression among Patients Before and After Percutaneous Coronary Intervention (PCI) at National Heart Institute (NHI)

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ABSTRAK

"Percutaneous coronary intervention" (PCI) dikenalpasti sebagai salah satu prosedur diagnostik invasif yang menimbulkan kebimbangan yang tinggi di kalangan pesakit jantung. Secara tidak langsung, peningkatan tahap kebimbangan ini akan menyebabkan pesakit merasa tertekan dan lantas, mengalami kemurungan. Objektif kajian ini adalah untuk mengenalpasti tahap kebimbangan dan tahap tekanan pesakit sebelum dan selepas PCI. Kajian deskriptif keratan rentas ini menggunakan instrumen "Hospital Anxiety and Depression Scale" (HADS) yang mengandungi dua elemen berkaitan dengan tahap kebimbangan dan tahap tekanan pesakit sebelum dan selepas PCI. Kajian ini telah dijalankan di wad kardiologi Anggerik dan Dahlia dan Jagaan Harian di Institut Jantung Negara (IJN) dari Januari hingga Februari 2006. Ia melibatkan seramai 61 responden yang memenuhi kriteria yang telah ditetapkan sebelum dan selepas PCI. Hasil kajian mendapati 40 dan 38 pesakit sebelum dan selepas PCI mengalami tahap kebimbangan yang rendah; seramai 47 dan 46 pesakit sebelum and selepas PCI turut mengalami tahap tekanan yang rendah. Tahap kebimbangan dan tahap tekanan sebelum and selepas PCI tiada perbezaan signifikan dengan faktor sosio demografik responden. Manakala, didapati korelasi yang signifikan ($p < 0.05$) di antara tahap kebimbangan dan tahap tekanan sebelum dan selepas PCI. Namun begitu, tahap kebimbangan dan tekanan yang rendah di kalangan pesakit sebelum dan selepas PCI di Insititut Jantung Negara (IJN) mungkin dipengaruhi oleh faktor seperti, kemudahan yang lengkap dan terkini serta pendidikan jagaan kesihatan yang diberikan oleh pakar kardiologi, jururawat dan juruteknik kardiak.

Kata kunci: penyakit jantung koronari, *percutaneous coronary intervention*, kebimbangan dan tekanan

ABSTRACT

Percutaneous coronary intervention (PCI) is an invasive diagnostic investigation that may

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result in high level of anxiety and "fear of the unknown" among cardiac patients. An increment in anxiety among PCI patients will augment the level of stress and this extreme stress level will then aggravate depression. The objective of this study was to determine the incidence of anxiety and depression before and after PCI. This was a cross-sectional descriptive study. The Hospital Anxiety and Depression Scale (HADS) was used. It measured two elements, namely, the anxiety and depression levels of patients before and after PCI. This study was conducted in the cardiology wards Anggerik and Dahlia, and Day Care of the National Heart Institute, from January to February 2006. A sample of 61 patients before and after PCI who fulfilled the inclusion criteria were recruited in this study. Of these, 40 and 38 patients before and after PCI respectively, had low anxiety levels; while, 47 and 46 patients before and after PCI respectively, had low depression levels. Anxiety and depression levels before and after PCI were not significantly correlated to socio demographic status. However, a significant correlation ($p<0.05$) was found between anxiety and depression levels before and after PCI. The low levels of anxiety and depression seen among patients before and after PCI at National Heart Institute could possibly due to the adequate facilities and health education program provided by the physician, nurses and cardiac technician.

Key Words: Coronary heart disease, percutaneous coronary intervention, anxiety and depression

INTRODUCTION

Coronary heart disease (CHD) is the major cause of morbidity and mortality in the world (American Heart Association, 2004). This trend has been predicted to continue until 2020 (WHO, 2005). In 2002, CHD caused 16.5 million deaths in the world and estimated to increase by 25 million annually (WHO, 2005). CHD is also the most common death in Malaysia and is a significant cause of disability among both men and women (Ministry of Health, 1998). It manifested as angina, silent ischemia, unstable angina, myocardial infarction, arrhythmias, heart failure and sudden death. Patients presenting with chest pain may be identified as having definite or possible angina from their history alone (Grech, 2004).

Several studies have proven psychosocial factors attribute and link to the increment of CHD risks (Donald, 2001). The coping mechanism of adaptation to anxiety and depression among CHD varies (Kulik & Mahler, 1993). An increase in anxiety among the CHD patients would augment the level of stress and this extreme stress level would then aggravate depression (Thompson & Webster, 2004). The normal physiological responses to stress are related to an elevation of the heart rate, altered tissue perfusion, hypoxia and electrolyte imbalance. These physiological changes would increase demand for oxygen consumption which leads to ischemic chest pain, arrhythmia or sudden death among CHD patients (Cruickshank, Bradburg, & Ashurst, 2000). According to Heikkla, Paunonen, Virtanen, & Laippala, (1998), PCI is a common invasive diagnostic investigation that could result in high levels of stress among CHD patients.

PCI was introduced in 1959 and it was considered as the gold standard for defining the anatomy of the main coronary arteries (Jowet & Thompson, 2003). The only absolute way to evaluate an individual's cardiac status for CHD is to perform a PCI and to monitor the haemodynamic status. PCI can be safely performed as a day case procedure. The procedure takes about half an hour and is performed under local anesthesia

(www.ijn.com).

Anxiety is defined as "the feeling of being very worried about something that may happen or may have happened, so that you think about it all time" (www.longman.com/dictionaries). A person is conscious of the unpleasant emotional state of threat or danger which can affect one's behavior and physiological system (Leonard & John, 2004). Several studies exploring the state of mind of PCI patients have been reported (Peterson 1991, Davis et al. 1994). There have been reports that PCI is a stressful and fearful procedure which could aggravate high levels of anxiety before and after the procedure. Finesilver (1980) reported that unrelieved anxiety usually increases the stimulation of sympathetic nervous system which lead to increment in cardiac workload. Increased sympathetic arousal has been reported to activate the occurrence of ventricular arrhythmias and sudden death (Leonard et al., 2004).

Depression is a normal phenomena expressed by the CHD patients, particularly if anxiety level is unrelieved and undetected (Lane and Mahler 2002, Jowett et al. 2003). Depression is defined as "feeling of sadness that makes you think there is no hope for the future" (www.longman.com/dictionaries).

Depression is expressed by a spectrum of mood disturbance ranging from mild to severe. The two cardinal symptoms are persistently pervasive, low mood and loss of interest or pleasure in usual activities (Leonard et al., 2004).

However, Marmot & Stephen (2002) reported depressive illness and symptoms could have contributed to higher and stronger evidence for depression among CHD patients. It acts as an antecedent for CHD patients too. In addition, disability due to poor quality of life and depression are associated with higher healthcare costs. Hence, CHD patients may encounter increasing high risk of re-infarction, re-hospitalization, morbidity and mortality (Leonard et al., 2004).

MATERIALS AND METHODS

This research study is a cross sectional study conducted in three cardiology wards of the National Heart Institute (NHI) from January to March 2006. The objective of this study was to determine the incidence of anxiety and depression in patients before and after PCI. Primary data was collected using fully structured questionnaires of the Hospital Anxiety and Depression Scale (HADS) adopted from Zigmond and Snaith (1983). HADS, is a 14-item questionnaire with fixed response statements (weight 0-3 for each item) divided into two separate sub-scales. The first sub-scales comprised of seven items to measure depression (HADS –D) and another 7 items to measure anxiety level (HADS- A). A score greater than 10 points equates to high significantly anxiety or depression level, 8-10 points is considered as moderate borderline and less than 8 points as low level. The same HADS questionnaires were used before and after PCI.

Probability sampling method was used, whereby all patients at NHI who fulfilled the inclusion criteria were recruited for this study. Sample size was calculated using the INFOPAC programme. 61 respondents participated in this study. The response rate was 100%. The inclusion criteria were patients who were scheduled for PCI (with or without angioplasty) and were able to understand Malay or English or both. The exclusion criteria includes critically ill patients (from coronary care unit), repeated angiogram due to complications after procedure such as pericardial effusion and cardiac tamponade and psychiatric patients. There were two sets of questionnaires; section A consisted of 14 items to measure anxiety and depression level HADS-D and HADS-A. Questionnaires were translated and back translated (English and Bahasa Malaysia). Section B consisted of 11 items on socio demographic data of respondents using nominal and ratio scale. A similar set of question-

naires were given to the patients before and after PCI.

Approval from the ethics committee (project code: FF-200-2005) of Faculty of Medicine, Universiti Kebangsaan Malaysia (UKM) and permission from the Chief Executive Officer (CEO) of NHI were obtained prior to commencement of the study. Socio demographic data were analyzed using the descriptive statistical analysis such as frequency and percentages. The Pearson correlation-coefficient test was used to determine the association between socio demographic data and anxiety and depression among PCI patients. One way ANOVA and t-test were also used to identify the relationship of respondents' socio demography with anxiety and depression.

RESULTS

Respondents before and after PCI anxiety levels

Before PCI, 12 respondents (19.7%) reported the highest level of anxiety and reduction to 9 respondents (14.8%) after PCI. It was found that moderate level of anxiety were 9 (14.8%) respondents before PCI whereas there was an increase to 14 respondents (23%) after PCI respectively. More than half of the respondents showed low levels of anxiety, 40 respondents (65.6%) before PCI with reduction to 38 respondents (62.3%) after PCI.

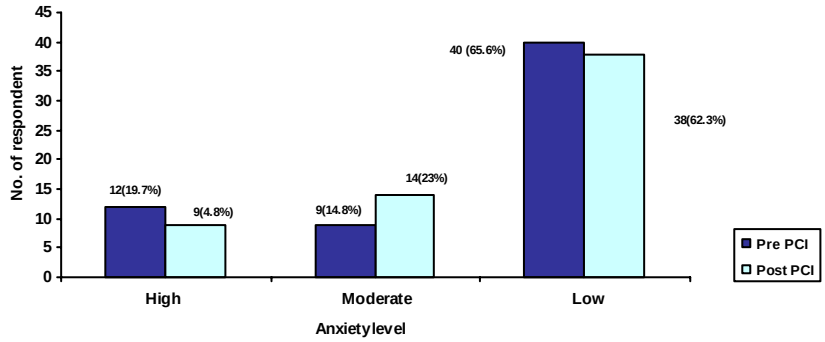

Figure 1 : Respondents before and after PCL anxiety levels.

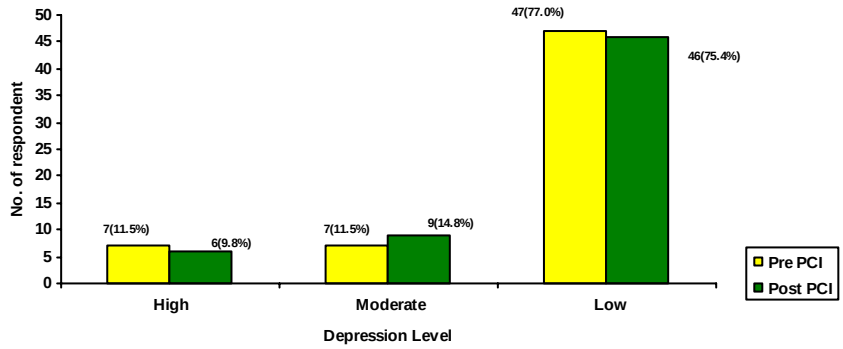

Figure 2 : Respondents before and after PCI depression levels.

Respondents before and after PCI depression levels

Respondents before and after PCI depression levels were identified. There were seven respondents (11.5%) reported with high depression level before PCI which was reduced to one respondent (1.7%) after PCI respectively. Before PCI, seven respondents (11.5%) reported to have experienced moderate depression level with a slight increase to two respondents (3.3%) after PCI. The lowest level of depression scored the highest with 47 respondents (77%) before PCI and one respondent (1.7%) after PCI respondents.

Respondents before and after PCI anxiety and depression levels.

There was a strong positive correlation between respondents before and after PCI anxiety levels (r =0.567, p value < 0.05) and before and after PCI depression levels (r=0.526, p values < 0.05).

Table 1: Respondent before and after PCI anxiety and depression levels.

Variable	r	Significant (2 tailed)
Anxiety pre PCI Depression pre PCI	0.567 (**)	0.000
Anxiety post PCI Depression post PCI	0.526 (**)	0.000

** Correlation is significant at the 0.01 level (2-tailed).

Respondents' socio demographic data, before and after PCI with anxiety levels.

Respondents' socio demographic data, before and after PCI with anxiety and depression levels were analyzed descriptively for frequency. The relationship between socio demographic data, before and after PCI anxiety and depression levels was analyzed using independent t-test and one way ANOVA. There were insignificant differences between respondents' socio demographic data in relation with before and after PCI anxiety and depression levels.

Table 2 : Respondents' socio demographic data

Socio Demographic	%(n)
Age	
30-54	34(56%)
55-65	27(44%)
Sex	
Male	52 (85%)
Female	9(15%)
Race	
Malay	37(61%)
Chinese	6(10%)
Indian	16(26%)
Others	2(3%)
Salary	
≤ RM 500	14(23%)
RM 501-1000	27(45%)
RM 1001- 2000	10(16%)
≥RM 2000	10(16%)
Status	
Married	56(92%)
Single	5(8%)
Occupation	
Self Employee	8(13%)
Private sector	17(28%)
Government	13(21%)
Pensioner	14(23%)
Not working	9(15%)
Experience	
First time	52(85%)
Second time	9(15%)
Co morbidities	
Yes	43(71%)
No	18(29%)
Duration of illness	
< one year	36(59%)
≥ one year	25(41%)
Education	
Primary School	13(21%)
Secondary School	45(74%)
University	4(5%)

DISCUSSION

The majority of respondents (before and after PCI) reported to have low levels of anxiety and depression in this study. Two thirds of the respondents showed a decrease in the level of anxiety and depression levels after PCI. This is consistent with the findings of Heikkla et al. (1998). At the NHI, it is mandatory for all patients and spouses to attend health

Table 2A : Respondents' demographic data in relation to before and after PCI, anxiety levels

Variables	Before PCI			After PCI		
	Mean Score SD	t	P value	Mean Score SD	t	P value
Age						
30-54	6.50 ± 2.820	0.463	0.645	6.06 ± 2.984	0.74	0.941
55-65	6.11 ± 3.735			6.00 ± 3.211		
Gender						
Male	6.29 ± 3.333	-0.227	0.821	6.02 ± 3.026	-0.082	0.935
Female	6.56 ± 2.744			6.11 ± 3.444		
Marital Status						
Single	4.60 ± 1.517	-1.253	0.215	7.40 ± 3.782	1.043	0.301
Married	6.48 ± 3.308			5.91 ± 2.999		
Duration of Heart Disease						
< one year	6.14 ± 2.880	-0.544	0.588	5.94 ± 3.189	-0.268	0.789
≥ one year	6.66 ± 3.731			6.16 ± 2.925		
Co morbidities						
Yes	6.16 ± 3.221	-0.613	0.542	5.93 ± 3.081	-0.402	0.689
No	6.72 ± 3.322			6.28 ± 3.083		
PCI Experience						
First time	6.15 ± 3.127	-1.010	0.316	6.12 ± 3.129	0.504	0.616
Second time	7.53 ± 3.841			5.56 ± 2.744		

p values <0.05 significant differences

Table 2B : Respondents' socio demographic data in relation to before and after PCI, depression levels

Variables	Pre PCI		Post PCI	
	Mean ± SD	Significant	Mean ± SD	Significant
Race				
Malay	5.24 ± 3.539	F = 0.118	5.35 ± 3.002	F = 1.093
Chinese	4.67 ± 3.933	P = 0.949	5.00 ± 1.789	P = 0.360
Indian	4.75 ± 3.194		4.44 ± 3.245	
Other	4.50 ± 3.536		8.50 ± 7.778	
Education				
Primary	6.54 ± 3.711	F = 2.276	6.08 ± 3.095	F = 0.667
Secondary	4.49 ± 3.131	P = 0.112	4.93 ± 3.151	P = 0.517
Diploma/Degree	6.67 ± 5.033		5.00 ± 3.606	
PCI Results				
Normal	4.82 ± 3.125	F = 0.234	3.82 ± 2.714	F = 1.002
PTCA done	5.21 ± 3.735	P = 0.918	5.04 ± 2.899	P = 0.414
For Stage PTCA	3.50 ± 3.697		5.50 ± 2.887	
For Medical Therapy	5.25 ± 4.031		6.50 ± 4.123	
For CABG	5.21 ± 3.068		6.07 ± 3.668	
Occupation				
Self employee	5.75 ± 3.151	F = 1.321	5.38 ± 3.538	F = 0.322
Private sector	4.12 ± 3.426	P = 0.273	4.88 ± 2.369	P = 0.862
Government	3.92 ± 3.353		4.54 ± 3.620	
Pensioner	6.00 ± 3.595		5.71 ± 3.539	
Not working	6.22 ± 3.114		5.67 ± 3.122	
Salary				
RM 0 - RM 500	5.36 ± 2.977	F = 0.410	5.14 ± 2.878	F = 0.223
RM 501-RM1000	4.96 ± 3.684	P = 0.746	5.52 ± 3.479	P = 0.880
RM1001-RM2000	4.10 ± 2.846		4.70 ± 2.669	
RM2001-RM4000	5.70 ± 3.974		4.80 ± 3.293	

p values <0.05 significant differences

education such as "pump talk" and orientation carried out by the physician, nurses, cardiac angiographer and cardiac technician. These prerequisites knowledge could have assisted them in clarifying their doubts about PCI. Health education session may have contributed to low level of anxiety and depression. Other confounding factors such as well trained staffs, equipped facilities, conducive environment and adequate technology could have also be other influencing factors leading to low levels of anxiety and depression.

Results from this study showed an increase in their moderate levels of anxiety and depression after PCI among the respondents. It was found that most of the respondents attributed their feelings of nervousness and inability to relax to the laboratory environment which consisted of bulky machineries, health care providers with masks and gowned, and dim lighted room. Thompson et al. (2004), also reported that the noise of the X-Ray equipment, the semi darkness, the masked and gowned staff, and the movement of the table during positioning, aggravated the anxiety level of patients. In addition, they were anxious when informed of their progression and intervention in relation to the findings of PCI. According to Rice, Caldwell, Butler & Robinson, (1986) it is better to inform the patients of pending PCI findings because the fear of anticipating the PCI findings can be greater than the procedure itself.

The levels of anxiety and depression in respondents before PCI were remarkably low; however, after PCI, their levels of anxiety and depression were even much lowered. Parker et al., (2006) reported that level of anxiety and uncertainties would be aggravated while waiting for revascularization. Meanwhile, Pederson et al., (2006) found only 41 (8%) respondents, out of 542 respondents gradually developed significant depressive symptoms at 12^{th} month post PCI. This result of the present study is similar with those previously published. It is hoped that future studies could include the follow up of post PCI respondents.

Results of this study showed a significant correlation between the presence of anxiety and depression both before and after PCI (p values, < 0.05). This association between anxiety and depression before and after PCI is congruent with the findings of Parker et al. (2006) who showed strong interdependence between an-xiety and depression among patients with acute coronary syndrome. Donald (2001) reported that depression and anxiety were prevalent among coronary heart disease patients.

However, there was no significant correlation between anxiety and depression levels to socio-demographic data. This could be due to the non inclusion of other factors that may contribute to anxiety and depression in this study. Sherry et al. (2005) stated that psychosocial factors were pivotal and greatly influenced psychological processes of an individual during the phases of their coronary heart disease. According to Koivula et al. (2002), similar findings with regards to the anxiety level of coronary patients were interfaced with the patients' social support and availability of resources.

CONCLUSION

In conclusion, results of this study show that anxiety and depression levels before and after PCI was low. There was a reduction in the anxiety and depression levels after PCI but it was insignificant. The low level of anxiety and depression seen among the PCI patients at NHI could be due to the adequate facilities, orientation and health education provided to them before and after PCI by the physician, nurses, cardiac angiographer and cardiac technician. In addition, holistic psychological support from the support groups may have further assisted these patients in reducing the levels of anxiety and depression. This may help the PCI patients

to cope to a better level and hence, lead to reduction in morbidity and mortality.

ACKNOWLEDGEMENTS

The development of this study would not have been possible without the contribution of many scholarly individuals. I sincerely would like to express my appreciation to Associate Professor Dr. Aliah Hanim M. Salleh, Encik Suhaimi Ahmad and Associate Professor Dr John Urban for their guidance and constructive critiques during various stages of development of this study.

Finally, I am further indebted to the Management of the National Heart Institute for granting permission to conduct this study.

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