

Psychological responses to cardiac diagnosis: Changes in illness representations immediately following coronary angiography

Daniel A. Devcich^a, Christopher J. Ellis^b, Greg Gamble^c, Keith J. Petrie^{a,*}

^aDepartment of Psychological Medicine, University of Auckland, Auckland, New Zealand

^bDepartment of Cardiology, Auckland District Health Board, Auckland, New Zealand

^cDepartment of Medicine, University of Auckland, Auckland, New Zealand

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Abstract

Objective: Coronary angiography is a commonly used diagnostic test for ischemic heart disease. Little is known, however, about how undergoing the procedure impacts on the ways in which individuals perceive their illness. We sought to explore patients' reactions to an angiogram in terms of changes in symptom appraisal, perceived consequences of their condition, and patients' illness concern and emotional response to their condition after the receiving diagnostic results. **Methods:** The Brief IPQ was administered to patients undergoing a diagnostic coronary angiogram ($N=57$) before and immediately following the procedure. Changes in illness representations were then compared between patients diagnosed with diseased arteries and patients with normal arteries. **Results:** We found that the number

of symptoms patients associated with their condition, illness consequences, and illness emotion decreased for patients receiving normal results but remained unchanged for patients receiving results showing diseased arteries. Illness concern decreased significantly for both patient groups. **Conclusions:** The results demonstrate that diagnostic results can have clear and immediate effects on how patients' view and emotionally respond to their symptoms. The results also suggest that patients cognitively prepare themselves to receive an unfavorable diagnosis and the pattern suggests those receiving normal results modify their perceptions in a positive direction rather than those receiving an unfavorable diagnosis.

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Introduction

Coronary angiography is a common medical procedure for the diagnosis of ischemic heart disease. In 1993, over 1 million patients underwent cardiac catheterization in the United States, making it the second most frequently performed in-hospital procedure [1]. Coronary angiography offers an accurate, minimally invasive means of viewing the distribution and severity of atherosclerotic lesions. A wide range of patient populations are referred for coronary

angiography, and diagnostic findings can range from concluding that the patient has normal coronary anatomy at one extreme to uncovering the existence of severe coronary disease at the other.

Despite the wide use of coronary angiography and the potential effect it may have on patients' views of their health, very little is known about the psychological impact of the procedure. Angiography is potentially a psychologically significant event, as patients' fears about the outcome of their symptoms may either be confirmed or allayed after receiving the results of the procedure. Angiogram results also have implications for future treatments (e.g., surgical interventions), which may need to be considered following testing [2]. Thus, coronary angiography offers a useful opportunity to study psychological changes following diagnosis—in particular, how the procedure impacts on patients' illness

* Corresponding author. Department of Psychological Medicine, Faculty of Medical and Health Sciences, University of Auckland, 85 Park Road, Private Bag 92019, Auckland, New Zealand. Tel.: +64 9 373 7599x86564; fax: +64 9 373 7013.

E-mail address: kj.petrie@auckland.ac.nz (K.J. Petrie).

perceptions and emotional reactions to their condition. While previous research has mostly focused on patients' views of their illness, with outcomes measured over relatively longer periods of time [3–5], little research has been undertaken to explore changes in illness perceptions following medical interviews or upon receiving the results of diagnostic tests.

In this study, we examined the changes in illness representations immediately following a diagnostic angiogram. We predicted that patients with normal angiograms, compared to patients with angiograms indicating significantly diseased arteries, would report significant decreases in illness identity and illness consequences as well as lower emotional reactions to their illness.

Methods

Participants

The study population comprised nonacute patients aged 18 years and over referred to the Cardiology Department at Auckland City Hospital for a routine outpatient diagnostic angiogram from July to September 2006. Only patients undergoing angiography for the first time were recruited. Patients were excluded from the study if the angiogram was conducted for the purpose of cardiac examination prior to

unrelated surgery or was conducted during hospitalization for a suspected or definite heart attack with the likelihood of requiring percutaneous coronary intervention or coronary artery bypass grafting.

Eighty consecutive patients who met the criteria were approached on the day ward by the researcher. Of these, eight refused to participate and a further 15 patients were excluded either because of failure to complete the post-angiogram questionnaire ($n=4$) or because of undergoing an unexpected stent procedure prior to administration of the postangiogram questionnaire ($n=11$). Thus, a total of 57 patients were recruited—23 with test results indicating normal arteries and 34 with test results showing diseased arteries. Ages of participants ranged from 43 to 81 ($M=63.89$, $S.D.=9.35$), and the sample consisted predominantly of males (67%).

Measures

Demographic and clinical data

Participants were asked to provide information including gender, age, marital status, ethnicity, employment status, living arrangements, level of education, and whether they had previously undergone any cardiac testing. Relevant clinical data were collected on the day of patients' angiogram (see Table 1), and results from the angiogram, as given by the attending cardiologist, were also recorded.

Table 1
Summary of clinical and psychological characteristics across patient groups

Characteristic	Patient group		P
	Normal arteries ($n=23$)	Diseased arteries ($n=34$)	
Lipids, M (S.D.)			
Total cholesterol	4.67 (0.93)	4.78 (0.89)	.69
HDL cholesterol	1.39 (0.41)	1.22 (0.24)	.08
LDL cholesterol	2.43 (0.84)	2.53 (0.70)	.66
Triglycerides	1.90 (0.93)	2.25 (0.98)	.22
Prior myocardial infarction	–	7 (20.6)	.03*
Prior heart failure	–	1 (2.9)	.99
Prior CVA (stroke)	–	3 (8.8)	.27
Prior CABG	–	1 (2.9)	.99
Prior cardiac rehabilitation	–	2 (5.9)	.51
History of smoking	11 (47.8)	26 (76.5)	.02*
Currently smoking	2 (8.7)	1 (2.9)	.56
Hypertension (on treatment)	12 (52.2)	25 (73.5)	.09
Family history of IHD	7 (30.4)	17 (50.0)	.11
Diabetic	–	3 (8.8)	.27
Cardiac medications			
Beta blockers	16 (69.6)	29 (85.3)	.15
Calcium channel blockers	4 (17.4)	14 (41.2)	.08
ACE inhibitors	4 (17.4)	8 (23.5)	.74
Statins	11 (47.8)	24 (70.6)	.08
Diuretics	3 (13.0)	2 (5.9)	.38
Antiplatelet agents	10 (43.5)	14 (41.2)	.86
Antiarrhythmics	1 (4.3)	1 (2.9)	.99
Trait anxiety, M (S.D.)	13.86 (4.92)	12.27 (4.24)	.20
Self-rated health, M (S.D.)	4.64 (0.95)	4.58 (0.97)	.82

Except where indicated, values show number of participants (with percentages in parentheses); HDL, high-density lipoprotein; LDL, low-density lipoprotein; CVA, cerebral vascular accident; CABG, coronary artery bypass grafting; M , mean.

* $P<.05$.

Psychological measures

Participants rated their current health, in comparison to someone in excellent health, on a 7-point scale from “terrible” to “excellent” [6], and completed the Short Form of the State-Trait Anxiety Inventory [7] and the Brief Illness Perception Questionnaire (Brief IPQ) [8]. The Brief IPQ assesses illness representation dimensions (identity, consequences, timeline, personal control, treatment control, concern, understanding, and emotional response to the illness) using an 11-point linear scale (0–10) for each dimension, with higher scores representing a stronger endorsement of that dimension.

Procedure

The study received ethical approval from the New Zealand Ministry of Health Regional Ethics Committee. After giving formal consent to take part, participants completed the baseline questionnaire prior to undergoing their angiogram. Patients then underwent their angiogram, which was performed to assess the degree of coronary atheroma present and establish the diagnosis of flow-limiting coronary artery disease which might be suitable for appropriate revascularization with angioplasty or coronary surgery. Following the angiogram, patients were classified as having either normal or diseased (i.e., $\geq 50\%$ luminal diameter narrowing of at least one major coronary artery) arteries. After receiving a diagnosis by their cardiologist while still in the catheterization laboratory, and having rested for 2 hours, participants completed the second questionnaire, which again covered illness perceptions.

Results

Baseline differences

No significant differences between normal and diseased artery groups were found in participant sociodemographic characteristics, use of cardiac medication, trait anxiety, and self-rated health. However, patients with diseased arteries were more likely to have had a prior myocardial infarction

and a history of smoking (see Table 1). No significant between-group differences in illness perceptions were found at baseline.

Following angiography

After receiving the diagnostic information, there were significant group \times time interactions regarding illness identity [$F(1,53)=13.00$, $P=.001$] and illness consequences [$F(1,54)=5.22$, $P=.026$]. Both interaction effects remained significant after controlling for the confounding variables of smoking history and prior myocardial infarction. Post hoc Bonferroni-corrected t tests ($P=.05/3$) revealed that patients with normal angiogram results, compared to patients who received a positive diagnosis, reported significant decreases in illness identity [$t(21)=5.52$, $P<.001$ vs. $t(32)=1.49$, $P=.15$] and illness consequences [$t(22)=2.92$, $P=.008$ vs. $t(32)=0.50$, $P=.62$]. These results show that patients who received a favorable diagnosis reported significant reductions in illness identity and illness consequences compared to patients diagnosed with diseased arteries.

In terms of the emotional changes upon receiving diagnostic information, we found a significant group \times time interaction regarding patients' reports on how much their illness affected them emotionally [$F(1,55)=9.40$, $P=.003$], and this remained significant after controlling for smoking history and prior myocardial infarction. Post hoc Bonferroni-corrected t tests revealed that patients with normal angiogram results, compared to patients who received a positive diagnosis, reported significant decreases on this Brief IPQ item [$t(22)=3.03$, $P=.006$ vs. $t(33)=0.11$, $P=.92$]. A significant group \times time interaction was also found for how concerned patients reported they were about their illness [$F(1, 55)=7.13$, $P=.01$]. Again, this remained significant after controlling for smoking history and prior myocardial infarction. However, post hoc Bonferroni-corrected t tests revealed significant pretest–posttest decreases in illness concern both for patients with normal arteries [$t(22)=5.06$, $P<.001$] as well as for patients with diseased arteries [$t(33)=3.73$, $P=.001$]. The remaining Brief IPQ items did not change following the diagnostic information (Table 2).

Table 2

Cognitive and emotional illness perceptions (Brief IPQ) measured before (T1) and after (T2) coronary angiography for normal and diseased artery groups

Brief IPQ variable	Normal arteries ($n=23$)				Diseased arteries ($n=34$)			
	T1	T2	T1–T2	95% CI	T1	T2	T1–T2	95% CI
Illness identity	5.17 (2.95)	2.82 (2.46)	2.35 *	1.42 to 3.13	5.21 (2.52)	4.76 (2.63)	0.45	–0.17 to 1.08
Illness consequences	5.61 (2.45)	3.70 (3.40)	1.91 *	0.55 to 3.27	4.67 (3.08)	4.38 (2.78)	0.29	–0.65 to 1.07
Treatment control	8.09 (1.44)	7.59 (2.89)	0.50	–0.63 to 1.63	7.91 (1.72)	7.68 (1.97)	0.23	–0.44 to 0.91
Personal control	5.77 (2.40)	6.68 (3.39)	–0.91	–2.17 to 0.35	5.85 (2.77)	6.06 (2.65)	–0.21	–1.10 to 0.69
Illness understanding	7.39 (3.23)	7.04 (3.44)	0.35	–1.19 to 1.89	7.09 (2.54)	7.82 (2.35)	–0.73	–1.50 to 0.05
Timeline	6.36 (3.29)	5.64 (4.01)	0.72	–1.14 to 2.59	7.71 (2.89)	8.36 (2.44)	–0.65	–1.58 to 0.30
Illness emotion	4.52 (3.57)	2.61 (2.55)	1.91 *	0.60 to 3.22	4.62 (2.64)	4.59 (3.02)	0.03	–0.52 to 0.58
Illness concern	7.26 (3.15)	3.83 (3.35)	3.43 *	2.03 to 4.84	6.88 (2.83)	5.41 (3.14)	1.47 *	0.67 to 2.27

Values show means of measured variables (with standard deviations in parentheses).

* P significant on post hoc tests ($P<.05/3$).

Discussion

The present study demonstrates that diagnosis following coronary angiography has a significant and immediate effect on patients' illness perceptions and on the emotional response to their condition. We found patients diagnosed with normal arteries showed decreases in the number of symptoms they associated with their condition (illness identity) and in the perceived consequences of their condition on their life, both of which remained unchanged for patients receiving angiogram results that indicated diseased arteries. Receiving normal results also caused a significant reduction in patients' reported emotional response to their illness, while this also remained unchanged in the diseased artery group. Interestingly, how concerned patients were about their illness decreased in both groups following angiography.

These results indicate that illness representations can change quickly in response to diagnostic information. The significant change in illness identity demonstrates that immediately following receiving normal test results, patients engage in a cognitive reappraisal of their symptoms in response to this new information. Symptoms previously seen as signs of an illness threat are subsequently minimized or re-evaluated as nonthreatening. Receiving normal results also immediately reduces the perceived consequences of the condition in the normal group but not the diseased artery group, indicating that prior to the angiography, patients may have already prepared themselves for receiving an unfavorable diagnostic outcome. This is also reflected in their emotional responses, with the emotional response to illness remaining unchanged in the diseased artery group but decreasing in the normal group. The drop in illness concern in both groups could be reflective of a previously reported threat minimization process following medical testing [9–12].

The strength of the present study is the demonstration of significant changes in illness representations within a clinical context and in relation to a real disease. The results indicate

that active psychological appraisal is discernible immediately following receiving diagnostic information. However, the study is limited by a relatively short follow-up period, and it is therefore unclear whether changes in illness representations remain stable over an extended time. Future research could therefore focus on investigating the long-term pattern of illness perception change following coronary angiography or indeed other forms of medical testing.

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