

The Natural History of Palpitations in a Family Practice

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A retrospective cohort study was conducted to assess whether palpitations are an independent risk factor for increased cardiac morbidity or mortality. A cohort of 109 patients with palpitations, seen over a five-year period in a primary care setting, was compared with an age- and sex-matched control cohort. Mean length of follow-up was 42 months. There was no statistically significant difference in incidence of morbidity or mortality (6.4 percent for the cohort with palpitations and 7.2 percent for the control cohort) between the two groups. This study suggests that palpitations are not an independent risk factor for increased cardiac morbidity or mortality.

Palpitations, the subjective awareness of the action of one's own heart, are a common symptom occurring in many normal individuals. Less commonly, palpitations are severe or worrisome enough that the patient seeks medical evaluation. There is uncertainty in the literature and among physicians about the prognostic significance of this symptom. It has been stated that patients with palpitations have a higher incidence of complex arrhythmias and significant cardiac disease, suggesting that they are at risk for an adverse outcome (myocardial infarction or fatal arrhythmia).¹⁻⁴

Several studies have evaluated the occurrence of complex arrhythmias in patients with palpitations. Sample sizes have ranged from 48 to 518 patients with a prevalence of complex arrhythmias between 29 and 85 percent (Table 1).¹⁻⁴ Many of these studies, however, have used patients referred to tertiary care centers and cardiologists, thus selecting from a population with a higher incidence of arrhythmias and coronary artery disease than might be seen in a primary care setting. In addition, numerous studies show the prevalence of complex arrhythmias to be between 6 and 77 percent (Table 2) when asymptomatic patients are evaluated with a Holter monitor.⁵⁻⁹

Most recently, Kennedy et al¹⁰ followed 73 patients with asymptomatic frequent and complex ventricular ectopy for a mean of 6.5 years. While the expected death rate in this group, based on standardized mortality ratios, was 7.4 deaths, only two deaths occurred. This finding suggests that asymptomatic healthy subjects with frequent and complex ventricular ectopy are not at increased risk of death.

The impression of many primary care physicians is that palpitations are not associated with a significant increase in morbidity or mortality. Unless associated with other risk factors, such as increased age, chest pain, and history of antecedent cardiac disease, palpitations are believed to be a relatively benign complaint. There is not, however, a strong body of literature to support this opinion. This study was undertaken to assess whether palpitations, when presenting in a primary care setting, are an independent risk factor for increased cardiac morbidity and mortality.

METHODS

A retrospective cohort study was conducted at the University of Missouri-Columbia using patients of the Family Medical Care Center. This center is a primary care clinic serving 15,000 patients each year with an average age of 28 years, of which 38 percent are male, drawn from Columbia and the surrounding area. A cohort of patients with palpitations was identified by screening the charts of all patients who visited the center between July 1, 1978, and June 30, 1983, who had one of the following nine

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TABLE 1. COMPLEX ARRHYTHMIAS IN PATIENTS WITH PALPITATIONS

Author	Year	Number of Subjects	Age (yr)	Percent Complex
Goldberg et al ³	1975	48	unknown	85
Tabatznik ²	1976	54	unknown	68
Zeldis et al ⁴	1980	518	unknown	50
Diamond et al ¹	1981	85	18-67	29

TABLE 2. COMPLEX ARRHYTHMIAS IN ASYMPTOMATIC SUBJECTS

Author	Year	Number of Subjects	Age (yr)	Percent Complex
Hinkle et al ⁸	1969	283	55*	37
Clarke et al ⁶	1976	86	18-65	12
Brodsky et al ⁵	1977	50	23-27	24
Glasser et al ⁷	1978	13	60-84	77
Raftery and Cashman ⁹	1978	53	20-74	6

* Mean age in years

TABLE 3. COMPARISON OF COHORT WITH PALPITATIONS WITH CONTROL COHORT

	Palpitation	Control
Mean age (yr)	43.3	42.5
Sex (% female)	63.2	63.2
Mean follow-up (mo)	41	42.5
Follow-up < 6 month (%)	11.9	10.1
Smokers (%)	40	39
History of cardiovascular disease (%)*	32	15 (P < .05)
History of psychiatric disease (%)**	41.4	29.4 (P = .06)

* History of hypertension, angina, or ischemic heart disease
 ** History of depression, anxiety, or major psychiatric illness

diagnoses: palpitations, ectopic beats, ischemic heart disease, atrial fibrillation and flutter, paroxysmal tachycardia, dizziness, dyspnea, chest pain, and syncope. Only those patients with a complaint of palpitations (perception of rapid, forceful, slow, irregular, or otherwise remarkable heartbeat) noted at clinic visit were included.

A comparison cohort of patients without palpitations was obtained using random selection of Family Medical Care Center patients, matched for age, sex, and year of clinic visit. Patients were randomly selected from all diagnostic categories, including the above categories, but only patients without a complaint of palpitations were included.

The hospital and clinic records of the patients in the two cohorts were reviewed with special attention to the following: nature of initial complaint, associated symptoms (chest pain, dyspnea, dizziness, diaphoresis, and syncope), personal habits (use of cigarettes, alcohol, and caffeine), medical history (medications and history of cardiac disease), psychiatric history (depression, anxiety, and major psychiatric illness), patient workup (physical examination, electrocardiogram, and Holter monitor), and treatment. Follow-up of these patients was obtained through review of subsequent visits to the Family Medical Care Center and other specialty clinics and review of hospital admissions. To improve the length and quality of follow-up, a telephone survey was also conducted.

Outcomes that were measured included death, myo-

cardial infarction, and potentially fatal arrhythmia (defined as ventricular tachycardia, ventricular fibrillation, and cardiac arrest). These particular outcomes were felt to be the significant types of morbidity and mortality that could be associated with palpitations.

RESULTS

The charts of 1,152 patients who were in the original nine diagnostic categories were reviewed. One hundred nine patients with palpitations were identified, and one hundred nine matched controls were selected for comparison. There was no significant difference between these two groups with respect to age, sex, or length of follow-up (Table 3). Follow-up was longer than six months for all but 12 percent of the subjects in the cohort with palpitations and 10 percent of the subjects in the control cohort.

Some of the potential confounding variables were virtually identical between the two groups, such as the history of smoking, which was present in 40 percent of the cohort with palpitations as compared with 39 percent of the control cohort. There were two major differences between these groups. A past history of cardiac disease was present in 32 percent of the cohort with palpitations but in only 15 percent of the control cohort, and a past history of psychiatric disease was present in 41 percent of the cohort of patients with palpitations but only in 29 percent of the control cohort.

The dependent variable, the occurrence of cardiac morbidity or mortality, was defined as the occurrence of myocardial infarction, potentially fatal arrhythmia (ventricular tachycardia, ventricular fibrillation, or cardiac arrest), and death. These events occurred in 6.4 percent of

the cohort with palpitations as compared with 7.2 percent of the control cohort. A high P value ($P = .84$), determined by chi-square, indicates that the null hypothesis (that these two groups have the same morbidity and mortality) cannot be rejected.

To ensure that an inadequate sample size did not account for the lack of difference between the two cohorts, a beta error was calculated. Beta-error calculation with an 80 percent confidence level showed that the relative risk of morbidity or mortality was less than 1.5 for patients with palpitations when compared with controls.

Of the patients with palpitations, 20 percent were treated with some antiarrhythmic. When the analysis was repeated after exclusion of those patients treated with antiarrhythmics, the results were essentially unchanged.

Known cardiovascular risk factors were associated with an expected increase in the rate of morbidity and mortality (Table 4). The relative risk of cardiac morbidity or mortality was 3.7 for smokers, 3.5 for subjects with a history of cardiovascular disease, and 8.0 for subjects aged 55 years or older.

Findings from physical examination and cardiac workup were also evaluated. An abnormal heart rhythm was noted in 16 percent of the patients with palpitations, and 3 percent had an abnormal heart rate noted in the chart. At the time of workup an electrocardiogram was performed on 62 percent of the patients, and 26 percent of these demonstrated ectopy. A Holter monitor was used in the evaluation of 20 percent of the subjects, and 52 percent of these subjects had abnormal findings. An exercise electrocardiogram was performed in only 5 percent of the subjects, and 33 percent of these were abnormal. None of these abnormal findings, however, predicted which patients would have an adverse outcome.

The relationship between palpitations and a past history of psychiatric disease was analyzed. A strong positive relationship between a past history of psychiatric disease (as defined by a history of depression, anxiety, or major psychiatric illness) and the recurrence of palpitations was found. Patients in the cohort with palpitations with a history of psychiatric problems had a 50 percent ($P < .05$) greater risk of having recurrent palpitations than those without a history of psychiatric problems.

DISCUSSION

These results suggest that patients with palpitations do not have an increased risk of cardiac morbidity or mortality as compared with a control population. Indeed, there was no difference in adverse outcomes, even though there was an increased prevalence of cardiovascular disease in the cohort with palpitations.

TABLE 4. MORBIDITY AND MORTALITY ASSOCIATED WITH EXPECTED CARDIAC RISK FACTORS

Risk Factor	Percent With Morbidity or Mortality	P
Smoker	12.7	<.05
Nonsmoker	3.4	
History of cardiovascular disease	14.0	<.05
No history of cardiovascular disease		
Age > 55 years	4.0	<.01
Age < 55 years	16.0	
	2.0	

These findings do suggest a relationship between a history of psychiatric illness and the recurrence of palpitations. Thus, even a mild psychiatric history of depression or anxiety, a frequent finding among many primary care patients, might indicate a predisposition to the occurrence of palpitations. Alternatively, a depressed or anxious patient who experiences palpitations might be more likely to seek medical care.

The possibility of a selection bias may affect generalizability of these results. The population of the Family Medical Care Center may not be representative of other primary care clinics because of the relatively young and healthy population that selects this clinic for care. In addition, access to health care in Columbia is relatively good, possibly accounting for an improved outcome. The finding of the expected associations of smoking, age, and cardiovascular disease history with increased morbidity and mortality provides some reassurance that this sample is not particularly distorted.

A greater problem is the potential for misclassification. The use of medical records to establish the complaint of palpitations is subject to missing some patients with palpitations that were recorded under another diagnosis. To help minimize this possibility, a number of related diagnostic groups were screened in the hope of identifying other patients with palpitations. Diagnoses of ectopic beat, paroxysmal tachycardia, and atrial fibrillation were used to identify the more common arrhythmias that could cause palpitations. Diagnostic categories such as dyspnea, chest pain, syncope, and ischemic heart disease were included to detect the more serious causes of arrhythmias. If these categories were not included, a bias in favor of better outcomes for patients with palpitations may have occurred.

There is also a potential for misclassification of outcome. Medical records may underestimate the incidence of morbidity and mortality, thus affecting the results of the study. In addition, the duration of follow-up, a mean

of 42 months, might be too short to detect a significant difference in outcome.

Potential confounding by health status and related illness is a final source of bias. The diagnostic categories used to decrease the chance of misclassification may have produced a study cohort with a higher incidence of cardiovascular disease, and thus a higher risk for a worse outcome. That a worse outcome for the cohort with palpitations was not observed serves only to strengthen the conclusion that palpitations are not a significant independent risk factor for increased morbidity and mortality.

Until recently, the literature has suggested that patients with palpitations should be evaluated with extensive testing and treated vigorously. The rationale for this approach is based on a high rate of complex arrhythmias in patients with palpitations.¹⁻⁴ Previous studies suggest, however, that frequent or complex arrhythmias may also occur at high rates in asymptomatic subjects.⁵⁻⁹ In addition, studies now suggest that complex or frequent ventricular ectopy may not be associated with an increased mortality as was previously assumed.¹⁰ This study suggests that palpitations, when seen in a primary care setting, are not associated with an increase in cardiac morbidity or mortality. This lack of association between palpitations and an increase in cardiac morbidity and mortality supports the common approach taken by many primary care physicians who treat palpitations as a benign complaint when they occur independently of other risk factors. The finding of an apparent association of psychiatric illness and pal-

pitations, especially recurrent palpitations, needs further exploration in future studies.

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