

Acupuncture in Patients with Valvular Heart Disease and Prosthetic Valves

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Summary

Endocarditis has been reported in patients with valvular heart disease who have undergone acupuncture treatment, although most have been associated with the use of semi-permanent needles. This has led reviewers to suggest that acupuncture may not only be contraindicated in such patients but that prophylactic antibiotics should be given.

This study investigated the use of acupuncture treatment in patients with proven valvular heart disease and observed whether endocarditis developed in such patients. All patients in a single-handed GP practice with proven valvular heart disease, including those with prosthetic valves, were identified over a ten-year period. Those who had undergone acupuncture treatment underwent a clinical examination and diagnostic tests, which focused on the signs, symptoms and laboratory criteria for the diagnosis of endocarditis and included a transthoracic echocardiogram. Autopsy findings were reviewed in any patient who died.

Based on these clinical and laboratory data, using the modified Duke's criteria for the diagnosis of endocarditis, patients were identified as having definite or possible endocarditis, or the diagnosis was rejected.

All patients underwent brief acupuncture with no skin disinfectant and no prophylactic antibiotics were given. Semi-permanent needles were avoided. Thirty-six patients with valvular heart disease underwent a total of 479 acupuncture treatments over a ten-year period. The median number of treatments was 9 (range 1 – 72), with a follow-up after treatment of 5.75 years (range 0.5 – 10 years). Definite endocarditis was not found in any patient, but two patients had possible endocarditis, eventually discounted by both negative blood cultures and echocardiography.

In conclusion, brief acupuncture was safe in this small cohort of valvular heart disease patients and no case of endocarditis was detected over a ten-year period.

Keywords

Acupuncture, valvular heart disease, endocarditis.

Introduction

Recent surveys have shown acupuncture treatment to be safe and the risk of major complications extremely low.¹⁻³ Subacute bacterial endocarditis is a known serious complication that can follow acupuncture treatment but the reporting of such events in the literature is rare.⁴⁻⁸ Of these isolated reports, most have been associated with the use of semi-permanent needles, which have been left in the ear. The reports of endocarditis associated with acupuncture have led some authors not only to suggest that those patients, in particular those with prosthetic valves, should not be given this

type of treatment but also that, if given, prophylactic antibiotics should be prescribed at the same time.^{4,5,9-11} The rationale being that the presence of valvular heart disease is the most common predisposing factor for the development of endocarditis,¹² and that an invasive procedure, such as acupuncture, is another factor associated with the development of this condition. However, one study has shown there to be no association of endocarditis with a variety of invasive procedures up to one year prior to the diagnosis of endocarditis.¹³ Therefore is acupuncture, an invasive procedure, safe in patients with valvular heart disease? This

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prospective study has attempted to determine whether acupuncture in patients with proven valvular heart disease is safe by reviewing all such patients who have undergone this treatment over the past 10 years, and to ascertain whether they developed or had evidence of bacterial endocarditis.

Methods

A computer search of patient records was performed in a single-handed GP practice to identify patients with a proven diagnosis of valvular heart disease, or who had undergone valve replacement surgery during the period November 1992 - April 2002. The records were searched not only for demographic data but also for the type and severity of the valvular heart disease present and whether they had undergone acupuncture treatment during the study period. Other information sought included any evidence that patients had been admitted to hospital or had been treated for endocarditis. All those who had undergone acupuncture treatment and were still alive during this period studied were invited to attend for a clinical examination during the period April to November 2002 and further diagnostic tests were performed to determine the presence of bacterial endocarditis. Initially a history and examination were undertaken on all patients who were alive. In particular, close attention was paid to the symptoms of fever, weight loss, night sweats, anorexia and malaise. Examination was particularly focused on the physical signs of vascular and immunological phenomena of endocarditis, such as splinter haemorrhages, Janeway lesions, Osler's nodes, Roth spots and petechial lesions in the extremities, together with the presence of a fever. All patients then had a full blood count, erythrocyte sedimentation rate (ESR), C-reactive protein (CRP) and dipstick urine test for haematuria together with a transthoracic echocardiogram looking in particular for changes to the cardiac valves associated with endocarditis. A minimum of three months had to have elapsed following their last acupuncture treatment before a clinical examination and investigations were carried out, to exclude low-grade infective endocarditis. All patients were told that this study would not only evaluate the progression of their valvular heart disease but also exclude the

presence of endocarditis. No patient refused the clinical examination or further investigations.

Those patients with valvular heart disease who died during the study period were identified by a computer search of medical records. They had their post-mortem results reviewed to see if cardiac valve vegetations or subendocardial abscesses were present.

Those patients who were alive were assessed as having possible endocarditis using a modified version of the Duke's criteria for the diagnosis of endocarditis.^{14,15} Patients were thus placed into the following categories - definite, possible or rejected categories - based on the presence or absence of major and minor clinical and laboratory criteria.

Major criteria comprised the following:

1. Definite findings of endocarditis on echocardiography
2. Positive blood culture for organisms typical of or consistent with infective endocarditis
3. Pathological findings at surgery or autopsy consistent with endocarditis

Minor criteria comprised the following:

1. A predisposing heart condition (i.e. valve disease)
2. Fever
3. Vascular phenomena of endocarditis, i.e. embolic episodes, petechiae and splenomegaly
4. Immunological phenomena of endocarditis, i.e. glomerulonephritis giving microscopic haematuria, presence of Osler's nodes and positive rheumatoid factor
5. Haematological evidence such as anaemia, C-reactive protein greater than 25mg/l and ESR greater than 50mm/hr

Definitive endocarditis required the following criteria to be fulfilled:

- a. two major; or
- b. one major and three minor; or
- c. five minor criteria.

Possible infective endocarditis was defined as:

- a. one major and one minor criteria; or
- b. three minor criteria.

Blood cultures were only undertaken on patients who were clinically unwell and/or fulfilled the criteria for definite or possible endocarditis. The reason for this was that the local

consultant microbiologist considered blood cultures to be of value only in patients where endocarditis was considered a possible diagnosis, based on clinical findings.

All patients had undergone deep and superficial acupuncture treatment using 15 to 75mm needles. These needles were left in-situ for no longer than 3 to 5 minutes and manually stimulated before being removed. No extra specific sterile precautions were undertaken and no prophylactic antibiotics given. No semi-permanent needles were used on any patient during the study period. No patient during the study period received acupuncture treatment from any other practitioner.

A review of the literature was made by the use of Embase and Medline from 1966 to the present day using acupuncture, endocarditis and valvular heart disease as search words.

Results

From November 1992 – April 2002 a total of 3,547 patients had at some stage been registered with the practice with an average list of 2,000 patients (range 2,300 – 1,920) over this period. This number did not include temporary residents.

In total 57 patients were identified who had been diagnosed as having valvular heart disease or had undergone a valve replacement. Thirty-seven of these had undergone acupuncture treatment, of which one was lost to follow up through moving away. The other 36 patients were clinically known to have valvular heart disease before starting acupuncture treatment. The ages of the patients ranged from 40 - 95 years (median 73 years). The valvular heart disease present in these patients is shown in Table 1. In total 22 patients had a single

valve lesion, 11 patients had two valves affected and in two patients three valves were affected. In all patients the diagnosis of valvular heart disease had been subsequently confirmed by transthoracic echocardiography. Ten patients were also on Warfarin therapy because of the presence of prosthetic valves (four patients), recurrent pulmonary emboli (two patients) or the presence of atrial fibrillation (four patients). Eighteen patients were on ACE inhibitors. The 36 patients studied underwent 479 acupuncture treatments during the period November 1992 to April 2002. The median number of acupuncture treatments per patient was nine, and the range was 1 to 72 treatments. The number of years of follow up from the time of initial acupuncture treatment to investigation by laboratory tests, clinical examination and echocardiography ranged from 0.5 to 10 years with a median of 5.75 years follow up. Four patients died during the study period, all underwent post-mortem examination and endocarditis was excluded in all cases by visualisation of the cardiac valves and subendocardial surfaces.

Of the 32 patients alive at the time of study, clinical examination revealed no evidence of the features of endocarditis and no fever was recorded in any patient. The only abnormalities detected were four patients with microscopic haematuria and three patients with anaemia (haemoglobin <12mg/dl). Of the four patients with microscopic haematuria two patients were on Warfarin therapy, two other patients had had the microscopic haematuria investigated by a urologist and no obvious cause was found.

Using the modified Duke's criteria for endocarditis no patient was diagnosed as having

Table 1 The type of valvular heart disease present in the 36 patients who subsequently underwent acupuncture.

Cardiac Valve Problem	Number of Cases	Mild	Moderate	Severe
Mitral regurgitation	15	10	5	0
Mitral stenosis	1	1	0	0
Mitral prolapse	2	2	-	-
Mitral valve repair	1	-	-	-
Aortic stenosis	9	2	6	1
Aortic regurgitation	13	8	5	0
Aortic valve replacement	4	-	-	-
Tricuspid regurgitation	3	3	0	0

Note: some patients had more than one valve lesion.

definitive endocarditis. Two patients were identified as having possible endocarditis, as both fulfilled this definition by having three minor criteria, namely the presence of a valve lesion, microscopic haematuria and anaemia. Both these patients had this diagnosis subsequently rejected since both had negative blood cultures. This was accompanied by negative echocardiography, and the absence of other clinical and biochemical features of endocarditis. Since investigation these patients have remained well.

Discussion

This is the first prospective study that has looked at patients with valvular heart disease who have undergone acupuncture and have then been followed clinically for the presence of endocarditis. There is no one good test for the diagnosis of endocarditis and that is why the Duke's modified criteria are used to determine the likelihood of this diagnosis. Using these criteria the specificity is 99% and sensitivity is greater than 80%.¹²

Unless valvular vegetations, subendocardial abscesses or dehiscence of the prosthetic valve from the cardiac wall are seen by transthoracic echocardiography or transoesophageal echocardiography, these other clinical and biochemical tests are used to aid diagnosis. Only two patients, using the Duke's modified criteria, suggested the possibility of endocarditis, but the diagnosis was subsequently rejected by negative echocardiography and blood cultures, together with the fact that these patients remained clinically well. This would suggest that these patients did not have endocarditis. The diagnosis of endocarditis was rejected in the case of the other patients because the Duke's criteria were not met, or because of the findings at autopsy in the case of those who died. Although this is a small study of 36 patients, they were followed up for a long period of time and underwent 479 acupuncture treatments in total.

The findings in these patients would suggest that the risk of endocarditis is low when brief acupuncture is used in patients with valvular heart disease. The majority of previous case reports of bacterial endocarditis associated with the use of acupuncture have been in patients who have had semi-permanent needles left in-situ. In total there

have been five case reports of endocarditis associated with the use of acupuncture, of which four had semi-permanent needles used. Even in these five case reports doubts were raised as to whether acupuncture was the source of infection in two of the cases.^{16,17} These isolated case reports have still led authors to suggest that, not only may acupuncture not be appropriate, but also that, if used, prophylactic antibiotics should be given prior to treatment in patients with valvular heart disease. Reviews of the literature of the complications of acupuncture treatment have also suggested that valvular heart disease is a contraindication in its own right to this type of treatment.^{9,10} A minority of authors have suggested that prophylactic antibiotics are impractical and that acupuncture may not be a contraindication in patients with valvular heart disease.¹⁶⁻¹⁸ The results in this study would seem to confirm that not only are prophylactic antibiotics, as suggested by other authors, not indicated, but also that acupuncture can be used in such patients. There is other indirect evidence to suggest this stance. A review of 100 cases of endocarditis in the USA failed to show that an invasive investigation had caused the development of this cardiac problem.¹³ Another detail is that the underlying rate of endocarditis has remained stable, at 1.7 – 6 cases/100,000 patient years over the past few years despite the increased uptake of acupuncture as a therapy.¹² The likelihood is that many patients undergoing acupuncture may be unaware that they have a cardiac problem, since, until the valvular heart disease progresses, many patients are asymptomatic. Yet there has been no dramatic rise in the reporting of bacterial endocarditis in the literature. Other evidence has shown that large numbers of bacteria need to be injected into the skin to cause infection.¹⁹ Also, the presence of a foreign body left in the skin after injection of organisms enhances the chances of such an occurrence. This may explain why endocarditis associated with acupuncture is usually associated with the use of semi-permanent needles left in the ear. The risk of introducing bacteria during therapy with acupuncture needles is lessened by the fact that they have a small cross sectional area to facilitate the introduction of bacteria but also by the fact they are neither cutting nor hollow needles

and are therefore less likely to trap skin cells and bacterial colonies into the tip of the needle.

What could be the benefits of acupuncture in patients with valvular heart disease? The main concern with patients who have valvular heart disease is that they are usually on other drugs such as Warfarin, diuretics or ACE inhibitors, as was the case with our patients. It is known that the use of NSAIDs used to treat musculoskeletal disease is more likely to lead to adverse events than the acupuncture itself. It is known that NSAIDs not only potentiate Warfarin therapy and may lead to GI bleeds but also that they counteract the effects of diuretics and ACE inhibitors if used. This may lead to unnecessary admissions to hospital. Acupuncture is not known to adversely affect patients using these drugs and may lead to relief of symptoms without causing increased morbidity or mortality.

In conclusion, this study would suggest that acupuncture treatment using brief needling techniques does not seem to be associated with the development of endocarditis in patients with valvular heart disease. A review of the literature would confirm this. However, the use of semi-permanent needles in such patients should be avoided, as these are likely to predispose to the development of endocarditis in this type of cardiac patient. This would allow an effective therapy such as acupuncture to be given to patients with valvular heart disease without the need to resort to drugs such as NSAIDs, which may be more likely to lead to adverse events in this group of patients.

Table 2 Results of clinical and investigative criteria for the diagnosis of endocarditis in the 36 patients studied.

History	0 / 32
Examination	
Clinical findings	0 / 32
Abnormal valve	32 / 32
Laboratory criteria	
Microscopic haematuria	4 / 32
Chronic anaemia	3 / 32
Echocardiography	0 / 32
Post mortem data	0 / 4

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