

CASE REPORT

Spontaneous Normal Sinus Rhythm Conversion Using Integrative Medicine in Atrial Fibrillation

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Key Words

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ABSTRACT

The relationship between acute life stress and the development of atrial fibrillation (AF) has been noted in the literature. However, the use of integrative medicine (IM) in restoring cardiac rhythm has not been adequately studied. This case report describes how an IM approach was used in a patient with atrial fibrillation and acute pain. Spontaneous cardioversion to normal sinus rhythm occurred during the IM session, in addition to marked decreases in self-reported pain, anxiety, and nausea at the conclusion of IM treatment. These results provide initial support that for some cases of AF, IM therapies can help to

reduce costs via avoidance of additional hospitalization, electrocardioversion, and general anesthesia.

摘要

文件指出沉重生活压力与出现心房颤动 (atrial fibrillation, AF) 之间的关联。但尚未对使用综合医学 (integrative medicine, IM) 恢复心律这一课题作出充分研究。该案例报告说明综合医学 (IM) 方法如何用于出现心房颤动和剧痛的患者。在综合医学 (IM) 疗程期间, 患者自动恢复至正常窦性心律, 此外在综合医学 (IM) 治疗结束时, 主诉疼痛、紧张和恶心的情况明显减少。

SINOPSIS

Se ha citado en la literatura una relación entre el estrés agudo vital y el desarrollo de fibrilación auricular (atrial fibrillation, AF). Sin embargo, el uso de la medicina integrativa (integrative medicine, IM) para restablecer el ritmo cardíaco no se ha estudiado adecuadamente. El informe de este caso describe cómo se usó un enfoque de IM en una paciente con fibrilación auricular y dolor agudo. Se produjo una cardioversión espontánea a un ritmo sinusal normal durante la sesión de IM, además de una reducción marcada del dolor, la ansiedad y las náuseas notificados por la paciente al finalizar el tratamiento de la IM.

Atrial fibrillation (AF) is a relatively common cardiac arrhythmia that can have adverse consequences related to (1) a reduction in cardiac output, and (2) atrial appendage thrombus formation (stroke and peripheral embolization). In addition, affected patients may be at increased risk for mortality.^{1,2} Diagnosis of AF is primarily through a 12 lead electrocardiogram (EKG) characterized by an absence of discrete P waves and an irregularly irregular ventricular rate. AF is more prevalent in men, is known to increase with age, and is commonly associated with underlying coronary heart disease (CHD) and hypertension.³

The trend toward not only offering but also integrating complementary and alternative medicine (CAM) therapies in the conventional medical care setting has catalyzed conceptualization of a new clinical paradigm. Several different terms are concurrently used to describe this practice, such as integrative medicine, integrated medicine, or integrative healthcare. However, there is still debate regarding the most appropriate terminology and how it should be defined.^{4,5} Because our program (at Penny George Institute for Health and Healing, PGIHH) has successfully integrated the use of CAM therapies in the hospital setting, we will refer to our providers as IM practitioners (IMPs), and the services provided as IM therapies.

PGIHH is located at Abbott Northwestern Hospital, a 629-bed tertiary-care facility in Minneapolis, Minne-

sota. PGIHH consists of inpatient services, an outpatient clinic, a research center, and a fitness center. Physicians and nurses predominantly make referrals to PGIHH; the most common reasons for referral are pain, anxiety, and nausea. PGIHH employs 21 IMPs, all credentialed as registered nurses, nationally certified massage therapists, or licensed acupuncturists. Since 2005, PGIHH IMPs have seen more than 25 000 hospitalized patients, with an average of 2.43 visits per patient. The use of IM and CAM in hospitals has more than doubled in recent years due to increasing patient demand, more robust research suggesting efficacy of IM therapies, and an effort toward healthcare market differentiation by hospitals and healthcare systems.⁶ IM therapies have been shown to be effective in many populations with pain, including (1) cardiac surgery,⁷ (2) thoracic surgery,⁸ (3) a general patient population in acute care,⁹ and (4) other surgical populations.^{10,11} The effectiveness of IM in an inpatient setting also has been established in observational studies.^{12,13}

The literature on the effects of IM on AF is exceptionally sparse for hospitalized patients. In one case study, the use of massage restored normal sinus rhythm during an episode of AF.¹⁴ Specific CAM modalities have been used to study effectiveness in reducing AF recurrence: (1) post-cardioversion patients receiving acupuncture had a lower recurrence rate of AF,¹⁵ and (2) a supervised yoga program was found to reduce the

number of episodes of AF in patients with paroxysmal AF.¹⁶ Massage was not shown to be effective in reducing postoperative AF in heart surgery patients.¹⁷ The role of stress in the development of AF^{18,19} and in reversible left ventricular systolic dysfunction²⁰ has been noted. Furthermore, in a hospital setting, pain management is therapeutically challenging and carries risks of side effects.²¹ In the cardiovascular population, the biological response to unrelieved pain is associated with increased sympathetic nervous system activity (eg, increased myocardial oxygen consumption, myocardial ischemia, tachycardia, hypertension, altered regional blood flow).²² In addition, stress is independently acknowledged as having an impact on cardiac function. Thus the treatment of unrelieved pain and AF with IM therapies is a reasonable consideration in a population with compromised cardiovascular health.

METHODS/INTERVENTION

The patient described in this case report provided written consent to the use of all medical information disclosed in this publication independent of general hospital admission consent. A 60-year-old African American female with morbid obesity, hypertension, untreated obstructive sleep apnea, and chronic kidney disease (stage 3) presented at urgent care with significant low back pain (LBP) and a “racing heart.” She also noted mild headache. After an EKG was performed, the patient was found to be in new onset AF with rapid ventricular response. She was transferred to Abbott Northwestern Hospital Emergency Department (ED) for further evaluation and care. Her vital signs on admission were as follows: BP, 174/81 mmHg; pulse, 124 bpm; height, 1.651 m (5’5”); and weight, 153.3 kg (338 lb). Associated symptoms were mild chest pressure, shortness of breath, and anxiety. She had never had an episode like this previously or been diagnosed with AF.

The severity of pain in this case is noteworthy. The patient had a 15-year history of LBP, primarily related to obesity. Diagnostic imaging confirmed the chronological worsening of her LBP prognosis. She was currently on leave from work due to the significance of the LBP and previously had been diagnosed with L5-S1 moderate disc herniation, mild L4-5 central spinal stenosis, grade I spondylolisthesis, and mild to moderate L3-L4 central spinal stenosis. She had recently taken a 1-week course of prednisone with no improvement in her symptoms. She refused narcotics for pain management in the ED and throughout her hospital admission. In the ED, she was started on medical therapy according to the AF protocol: (1) intravenous heparin 25 000 units in D5W 250 mL, 1650 units/h continuous; (2) intravenous heparin 3 100 units injection (1000 units/mL) one time; (3) intravenous diltiazem 100 mg in D5W, 100 mL 10 to 15 mg/h continuous; and (4) intravenous diltiazem 15 mg injection (15 mg of 25 mg/5 mL) one time. Additional medications included (1) Medrol Dosepak (Pfizer Inc, New York) 8 mg twice daily; (2) acetaminophen 650 mg, every 4 hours as needed; (3) aspirin 325 mg one time; (4) loraz-

epam 1 mg, every 4 hours as needed; (5) ondansetron 4 mg injection every 6 hours as needed; and (6) tramadol 50 to 100 mg tablet (1-2 x 50 mg tablet) as needed. The patient was admitted to the cardiac telemetry unit, and electrocardioversion was scheduled 36 hours later in the event that medical treatment was not effective.

PGIHH received a nurse referral to see the patient for back pain and anxiety; she was seen approximately 21 hours after hospital admission (25 hours after confirmed tachycardia and AF in urgent care). A self-report 10-point rating scale (0 = no symptom present, 10 = worst possible symptom imaginable) commonly used in inpatient settings was used to rate pain, anxiety, and nausea. The patient reported acute pain (8/10), complained of nausea (6/10), and was extremely anxious (10/10). The patient was experiencing emesis as the practitioner arrived in her room and was writhing in pain. She reported that the pain medication was not helping her LBP. Although unfamiliar with CAM approaches or modalities, the patient was open to trying any treatments that might help decrease her pain, nausea, and anxiety. Based on the IM practitioner’s clinical experience and familiarity with relevant research, a multimodality approach was selected. First, the environment in the room was adjusted (lights dimmed, calming music played on the hospital’s Continuous Ambient Relaxation Environment [CARE] channel, door closed, and sign placed on door to prevent interruptions) to promote a more relaxing setting. The following modalities were used (listed chronologically) in the 45-minute session: (1) clinical aromatherapy using 2 drops of spearmint (*Mentha spicata*) essential oil placed on a cotton ball for inhalation and another 2 drops added to 5 cc (to obtain a 2% solution) of massage lotion; (2) guided imagery in which the patient was encouraged to picture herself in a peaceful place and focus on a positive image to encourage the relaxation response; (3) Korean hand therapy, with 5 beads being placed on the area of the patient’s hand corresponding to the area of her back pain; and (4) bilateral foot massage using gliding, kneading, and holding with gentle pressure.

During the session the patient visibly relaxed, her breathing slowed and deepened, and her physical agitation markedly decreased. The IM practitioner noted her heart rate to be 40 bpm, and the registered nurse (RN) was immediately informed. Upon consultation, the RN immediately turned off the heparin, and it was suspected that the patient had converted to normal sinus rhythm. An EKG was ordered and confirmed the patient had indeed converted during the time of the session (Figure). This was clinically confirmed by the electrophysiology nurse practitioner and the attending cardiologist. When requested at the end of the session, the patient’s post-treatment scores were (1) pain: 5/10 (37.5% reduction), (2) nausea: 4/10 (33.3% reduction), and (3) anxiety: 5/10 (50% reduction). No general or AF protocol medication changes were made prior to the IM intervention. The patient remained in normal sinus rhythm (NSR), and was discharged the following day

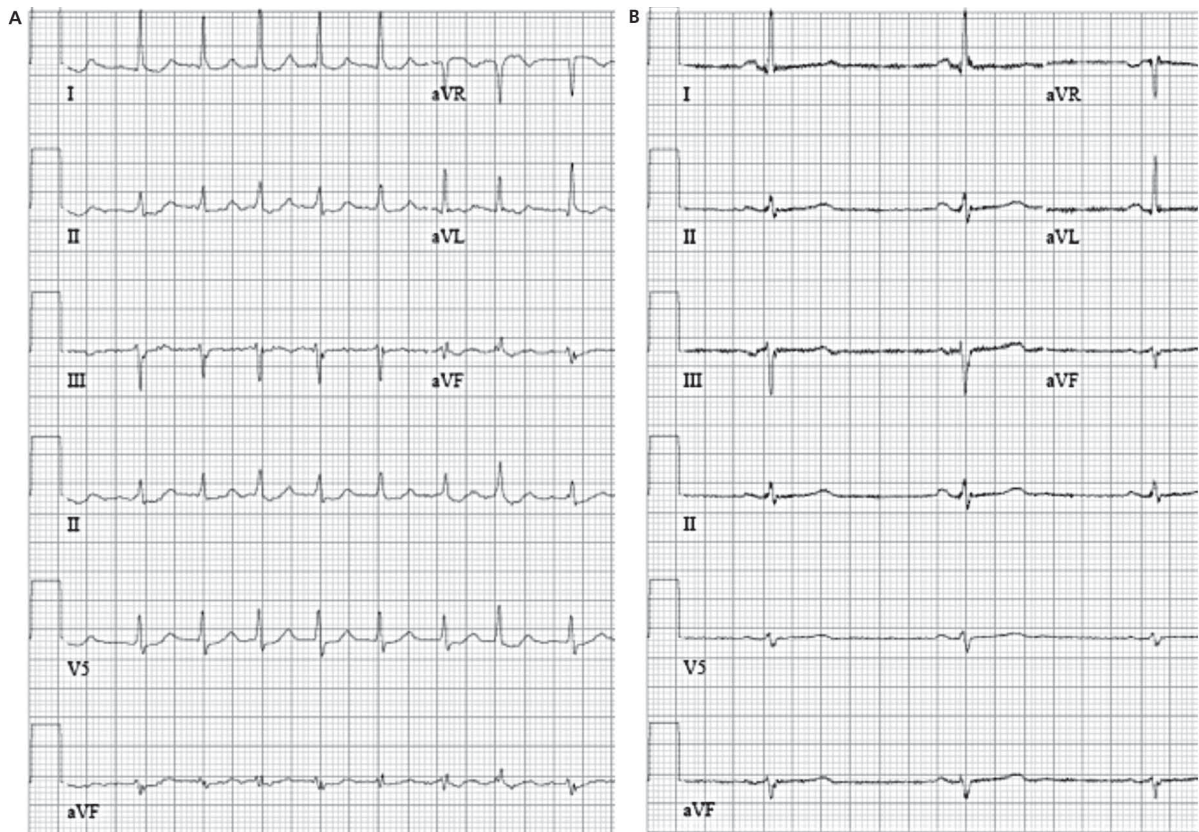


Figure Pre-treatment electrocardiogram [EKG] (day of admission: 18:05, confirmed EKG findings in urgent care), A, in comparison to post-treatment EKG (day after admission: 14:59), B.

without the scheduled electrocardioversion. In a follow-up conversation 2 months after discharge, the patient stated she had not had any additional IM treatments, hospitalizations, or similar symptoms (ie, “racing heart”) since discharge.

DISCUSSION

There are various ways to explain what occurred during the IM session. The possibility exists that the patient’s rhythm would have converted without intervention, as many patients with lone AF of short duration do convert spontaneously to a sinus rhythm, including those patients who develop AF after an acute life stressor.¹⁹ Another possibility is that pharmacological intervention had its intended effect. A final option is that IM played a major role in the patient’s conversion to NSR. The impact of IM is worth consideration because (1) the patient had not converted spontaneously within 24 hours of admission, (2) pharmacologic intervention up to the point of IM treatment (26 hours) had been ineffective, and (3) the conversion to NSR occurred during the IM session.

Previous research suggests that during an acute coronary event, patients perceive both intense pain and extreme distress. The severity of pain experienced during an event is directly correlated with the level of psychological distress: 3 out of 4 patients with acute coronary syndrome report moderate or high stress

explicitly because of the severity of pain during the event.^{23,24} It is reasonable to consider the pain-stress relationship in a different cardiac population and how treatment options aimed at targeting this relationship could be clinically beneficial. The stress response (SR) or fight-or-flight response is a mind-body state of hyperarousal involving unconscious physiological mechanisms (eg, increased heart rate, blood pressure, respiration, and availability of energy stores) that prepare a given organism to successfully survive stressful experiences.²⁵ The relaxation response (RR) is a mind-body state with a coordinated physiological response that is characterized by measurable reductions in volumetric oxygen and carbon dioxide consumption, respiratory rate, systolic blood pressure, diastolic blood pressure, and arterial blood lactate.²⁶ Another prominent feature is enhanced “well-being.”²⁵⁻²⁸ Since many of the physiological changes occur in the opposite direction to those of the SR, the RR has been hypothesized as its physiological counterpart.²⁶ Accordingly, the RR is widely utilized clinically in outpatient and inpatient communities to counteract the undesired physiologic and psychological effects of stress.²⁷ It is therefore reasonable to consider that by activation of the parasympathetic nervous system, the physiological response is in some way associated with the conversion to NSR. Other related biological changes may well occur during IM interventions but are not as easily documented. Finally, IM therapies

could provide a more cost-effective approach when considering the overall burden of healthcare costs; in this case, additional hospitalization, electrocardioversion, and general anesthesia were avoided.

LIMITATIONS

Although the IM intervention was likely successful in restoring cardiac rhythm in one patient, it is difficult to conclusively determine that IM was the cause of the spontaneous conversion to NSR. It is possible that spontaneous conversion to NSR could have occurred at the discrete point in time independent of IM intervention.²⁹ It is noteworthy that NSR conversion occurred 25 hours after medical treatment was initiated and during the IM session (after the patient's marked pain and anxiety were reduced by IM). The majority of patients with AF of less than 72 hours' duration converted spontaneously to NSR, with a duration of less than 24 hours being the best predictor.³⁰ In addition, the level of overall distress in this particular patient was significantly higher than that in the majority of patients seen by the telemetry department. Consequently, the results are more striking considering the severity of the situation. As a result, a holistic approach using a variety of IM modalities might be beneficial to consider in a patient with similar acuity and may give clinicians and researchers alike a better sense of what patient populations to consider for IM therapies. Generally, IMPs use 1 to 3 modalities; more were used in this case due to the severity of the patient's clinical pain, anxiety, and nausea. It is therefore difficult to determine which modality was most effective and to determine a clinically appropriate dose of a specific therapy. However, we would suggest that the clinical improvement outweighs this reductionist argument. Lastly, a larger study with a more robust methodology investigating AF, pain, stress, and the pain-stress relationship necessitates consideration as a case report can have considerable statistical and methodological limitations.

CONCLUSION

In patients with new onset AF who are in acute pain and who do not convert spontaneously, an IM approach is worth consideration. In this case, the treatment provided was brief and safe and quantitatively improved pain, anxiety, and nausea scores. Furthermore, because spontaneous conversion to NSR occurred during the IM session, it remains a possible treatment approach for spontaneous conversion to NSR.

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