PROGRESS IN MEDICAL SCIENCES, 2020
VOL 4, NO. 1, PAGE 1 – 2
DOI: doi.org/10.47363/PMS/2020(4)124

RESEARCH ARTICLE

Open Access

Estimation of Fall Risk in Geriatric Patients with Arrhythmias Prior and After Pacemaker Insertion

Efstathios Konstantinou Koutsostathis

Kerameikos Health Center, Greece

ARTICLE HISTORY

Received Dec 12, 2020
Accepted Dec 21, 2020
Published Dec 30, 2020

Introduction

There is a high prevalence of arrhythmias among the geriatric population with recurrent falls. Cardiovascular causes such as carotid sinus syndrome, vasovagal episodes, sick sinus syndrome and atrioventricular block are implicated in a significant proportion. On the other hand, falls are among the leading causes of disabilities among the elderly. Sinus mode disease and other cardiac arrhythmias are a potential great factor of increased risk for fractures and those patients may benefit from therapies such as pacemaker implantation, as it is indicated in the correlated literature [1-5]. The aim of this study is to compare the relative literature on the correlation between fall risk and arrhythmias and to estimate the benefit of a pacemaker insertion in relationship with the reduction of falls.

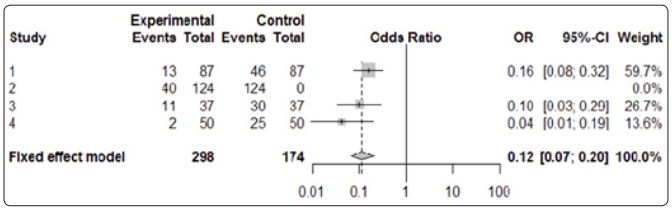
Methods

A brief review of relevant articles (most of them prospective studies and one randomized control trial) between ages 1995 and 2016 was performed [1-5]. Falls were defined in accordance with the WHO as the unintentional coming to rest on the ground, floor, or other lower level, excluding intentional or accidental change in position which may have as a consequence rest in furniture, wall or other objects. We included studies that investigated the number of fallers and the absolute number of falls prior and after the placement of a pacemaker. In the 1st study, the number of falls is also associated with injury, fracture and surgery needed before and after implantation of a pacemaker. In most studies, patients were above 70 years old (mean age) and have been under surveillance (after the insertion of the pacemaker) for at least 10 months. The age range varied from 56 years old to 91 years. In all surveys, the main selection criterion was the immediate correlation of fall risk with cardiac arrhythmia, while other risk factors were excluded.

Although there is a great amount of according surveys as far as falls and diseases in the elderly are concerned, there are few studies that estimate the relation between pacemaker placement and reduction of falls, basically due to the significant difficulty of collecting information from elderly patients after the placement of a pacemaker. Descriptive statistical analysis methods were used in all surveys (mostly paired t-test).

Results

In all (5) articles, the insertion of a pacemaker has proven to reduce significantly the absolute number and percentage of falls and fractures in the elderly [1-5]. In the first study, it is concluded that falls after the insertion of a pacemaker were reduced by 84% [1], in the third by 90%, and in the fourth by 95% [3, 4]. The total % reduction in falls was 89%, respectively. (The second study, could not be taken under consideration, since all patients had experienced falls before the placement of a pacemaker.)



Statistical analysis

LOG ODDS RATIO

1st study: 0,1566 [0,0759;0,3231] 59,7 53,7

2nd study: NA 0,0 0,0 0,0

3rd study: 0,0987 [0,0334;0,2917] 26,7 29,7

4th study: 0,0417 [0,0091;0,1904] 13,6 16,6

Relative Risk

1st study: 0,282

6 [0,1648;0,4846] 44,9 42,5

2nd study: NA 0,0 0,0

3rd study: 0,3667 [0,2182;0,6163] 48,4 43,7

4th study: 0,0800 [0,0200;0,3199] 6,8 13,8

Total RR: 95%-CL z p-value

Fixed effect model : 0,2942 [0,2050;0,4222] -6,64 {0,0001

Contact Efstathios Konstantinou Koutsostathis ✉ e.koytsostathis@gmail.com Kerameikos Health Center, Greece.

Random effects model : 0,2662 [0,1496;0,4753] -4,50 {0,0001

Conclusion

Pacemaker therapy is greatly effective in preventing falls and fracture injuries in the elderly, both in Europe and in the USA. Although, the placement of a pacemaker in the elderly seems to play an important role in the reduction of falls, there is still reference in the literature concluding that additional research is needed, especially on atrial fibrillation, while other surveys conclude that: "many falls may be preventable through permanent pacemaker implantation in appropriately selected patients''[6]. Furthermore, some researchers argue that pacemaker implantation is not a statistically significant factor for the reduction of falls (especially in patients with carotid sinus syndrome and carotid hypersensitive syndrome) [7,8]. Falls are a serious problem in the elderly population, often associated with unplanned hospitalization, surgical treatment and nursing home care. Of course, there are many other etiological factors for the falls in the elderly such as osteoporosis, Vitamin-D deficiency, syncope and others. All these risk factors should be assessed and treated accordingly so that elderly patients may achieve a better quality of life [9-10].

References

[1] Brenner R, Ammann P, See-Il Yoon, et al. Reduction of falls and fractures after permanent pacemaker implantation in elderly patients with sinus node dysfunction. Europace. 2016; 19:1220-1226.

[2] Krasniqi N, Segelada D, Thomas F Lüscher, et al. Falls and fractures in the elderly with sinus node disease, the impact of pacemaker implantation. Cardiol Res Pract. 2012; 2012:498102.

[3] Crilley JG, Herd B, CS Khurana, et al. Permanent cardiac pacing in elderly patients with recurrent falls, dizziness and syncope and a hypersensitive cardioinhibitory reflex. Postgrad Med J. 1997; 73:415-8.

[4] Kenny RA, Richardson DA, N Steen, et al. Carotid sinus syndrome: a modifiable risk factor for non-accidental falls in older adults. J Am Coll Cardiol. 2001; 38:1491-6.

[5] Karunaratne PM, Broadhurst PA, Norris CA. Outcomes of permanent pacemaker implantation for carotid sinus hypersensitivity in a district general hospital with a falls fits faints and funny tuning clinic. Scott Med J. 2002; 47:128-31.

[6] Maurer MS, Bloomfield DM. Atrial fibrillation and falls in the elderly. Clin Geriatr Med. 2002; 18:323-337.

[7] Ryan DJ, Nick S, Colette SM, et al. Carotid sinus syndrome, should we pace? A multicenter, randomized control trial (Safepace 2). Heart. 2010; 96:347-351.

[8] Parry SW, Steen N, Bexton RS, et al. Pacing in elderly recurrent fallers with carotid sinus hypersensitivity: a randomized, double blind placebo control crossover trial. Heart. 2009; 95:405-409.

[9] Faddis MN, Rich MW. Pacing interventions for fall and syncope in the elderly. Clin Geriatr Med. 2002; 18:279-294.

[10] Dey AB, Bexton RS, M M Tyman, et al. The impact of a dedicated "syncope and falls" clinic on pacing practice in northeastern England. Pacing Clin Electrophysiol. 1997; 20:815-817.