JPUMHS

Open Access Original Research Article

EFFECTS OF ARECA NUT AND ITS PRODUCTS ON ELECTROCARDIOGRAM IN POPULATION OF NAWABSHAH SHAHEEDBENAIRABAD.

Altaf Khan Pathan[1], Aftab Hussain Pathan[2], Ghulam Muhammad Phull[3], Masood Nabi Noor Dahri[4], Tabinda Taqi[5], Safdar Ali Pervez Tunio[6].

ABSTRACT

INTRODUCTION: Cardiovascular diseases are the major cause of death worldwide. Diseases of cardiovascular system (CVD) at present records for almost 50% of no communicable diseases (NCDs). **OBJECTIVES:** To determine the effects of areca nut and its products on Electrocardiogram. **MATERIAL & METHODS:** This case control study was carried out at Physiology Department Peoples University of Medical and Health sciences, Shaheed Benazirabad. Total 368 study subjects were included. Case group comprised of 184 study subjects which were regular users of areca nut and its products like pan, gutkha, supari and mainpuri. In other group 184 healthy controls were selected who were non users' of areca nut or its products.12 lead ECG of participants were performed by electrocardiograph. **DURATION:** From Jan 2018 to Jun 2018. **PLACE:** Nawabshah Shaheed Benazirabad. **RESULT:** Total 368 subjects were selected in the study in which 226 were Males (61.42%), 142were females (38.58%). Mean age of Case group areca nut users was 25.61±5.25 years, and mean age of control group non users was 26.62±5.17 years. In Case group areca nut users, Gutkha users were 64 (34.8%), pan users 47(25.5%), Supari users 43 (23.4%) and Mainpuriusers 30 (16.3%). On comparing electrocardiogram in both groups, arrhythmia was more prevalent in areca nut and its products users, as there were 32 cases of arrhythmia as compare to 18 cases in control group. The most frequently found arrhythmia in areca nut and its products users was atrial fibrillation and supraventricular tachycardia, and in non-users frequently found arrhythmias are premature ventricular contraction, sinus tachycardia and sinus bradycardia. **CONCLUSION:** It is concluded that cardiac arrhythmias were found more prevalent in areca in areca nuts and its products users in comparison with control group non users of areca nut.

KEYWORDS: Areca nut, cardiac arrhythmia, atrial fibrillation.

1. Assistant Professor Department of Physiology PUMHS Nawabshah
2. MSPH student Department of Community Medicine PUMHS Nawabshah.
3. Assistant Professor Department of Physiology Gambat Medical College Gambat.
4. Assistant Professor Department of Physiology PUMHS Nawabshah.
5. Associate Professor Department of Physiology PUMHS Nawabshah.
6. Associate Professor Department of Medicine KMC Khairpur Mirs.

Corresponding author: DR Altaf Khan Pathan, Assistant Professor Department of physiology PUMHS. EMAIL**:** altafkk@hotmail.com

How to cite this article: Pathan AK[1], Pathan AH[2], Phull GM[3], Dahri MNN[4]. TaqiT[5], Tunio SAP[6]. **EFFECTS OF ARECA NUT AND ITS PRODUCTS ON ELECTROCARDIOGRAM IN POPULATION OF NAWABSHAH SHAHEEDBENAIRABAD.***JPUMHS; 2021:11:03,09-13.*
http://doi.org/10.46536/jpumhs/2021/11.03.343

Received Jan 4 2021, Accepted On 25 feb 2022, Published On 31 March 2022

INTRODUCTION

Cardiovascular diseases are the major cause of death worldwide. Diseases of cardiovascular system (CVD) at present records for almost 50% of non communicable diseases (NCDs). The number of cases of NCDs now a day increased than communicable diseases, becoming the world's major health issue, among NCDs the heart diseases remaining the main worldwide reason for death and nearly 17.3 million deaths per year due to CVDs, a number that is expected to grow to 23.6 million by 2030[1]. There are many risk factors for developing cardiovascular diseases. Worldwide studies showed that chewing betel nut or areca nut is also a risk factor for cardiovascular diseases, Wen-Yuan Lin et al (2008) showed that areca nut chewing was associated with increased risk of CVD and mortality in Taiwanese men[2].

Areca nut and its different products are also associated with increased risk of atrial fibrillation which is most common tachyarrythmia[3]. Areca nut also called betel nut, and is the 4th common psycho

stimulatory product around the globe after nicotine,caffeine, and alcohol[4]. Areca nut is chewing substance obtained from tropical palm tree found in different countries called Areca catechu[5].The areca palm tree from which first raw areca nut and then its products are made is shown in **(Fig.1)** with its fruit and branches[6].

The different products made from betel nut are the Supari, Mainpuri, Mawa, Gutkha and Paan Masala[7]. It is chewed worldwide particularly in numerous Asian countries, including India, Pakistan, Bangladesh, Myanmar, Cambodia, Indonesia, Philippines, and Vietnam. The greatest using nation of areca nut is archived as India[8]. In Pakistani population prevalence of betel nut is very high among people living in cities. A study conducted in Karachi showed 40% prevalence of using areca nut in population[9,10].

India is the greatest maker and also purchaser of areca nut, a survey was conducted in Wardha an Indian city, in which gutkha using frequency was observed 20% in women and 46.4% in males[11].

Pakistan stands second next to India in which these areca nut items are expended, with a frequency of male Pakistani 21.3% and female 19.3% using areca nut and its products. In Pakistani largest city Karachi 40% of the residents were daily users of areca nut Products[12].

The general frequency of betel made items among man was 50.3%, and in women was 28.5%. In Karachi a study on school going children was done, revealed that above 74% of students' utilized areca nut on a day by day basis[13].

Areca nut products like pan, gutkha, supari are associated with vast variety of cardiovascular adverse effects including alteration in blood pressure, ECG, cardiac mortality and cardiac ischemia[8]. A study in Taiwanese men indicated that increase frequency of AF was independently related to areca nut chewing[3].

Areca nut and its products are dangerous for our overall health especially cardiovascular system as they are related with increase cardiovascular problems like hypertension and cardiac arrhythmia, so this study is intended to make association between areca nut use and cardiac arrhythmia.

MATERIAL & METHODS

This case control study was carried out at Physiology Department of PUMHSW Shaheed Benazirabad from January 2018 to June 2018. Total 368 Study subjects were selected from the community of Nawabshah city.The sample size of 184 cases and 184 controls were calculated through standard formula for case control study. All cases of regular users of areca nut or its products and also healthy controls were selected through convenient non probability sampling. The study approval was taken from ethical review committee of PUMHSW Shaheed Benazirabad. Verbal informed consent was taken from the willing participants.

Young age physically active individuals from 18 to 35yrs both male and female who were regular areca nut and its products users for more than 1 year were included in study. The persons having congenital heart disease, Smokers, Obese, having Diabetes Mellitus, Hypertension or Sedentary life style were excluded. 12 lead ECG was performed. All the relevant information of study was documented on predesigned questionnaire by researcher himself. All data was entered in SPSS version 23.0 and was analyzed. Chi-square test was applied for Qualitative data, and for quantitative data independent t-test was used. Results are presented by tables and graph.

Fig.1: Areca palm tree with fruit and branches

RESULTS

Table:1. Shows that mean age of case group was25.61±5.25 years, and mean age of control group non users was 26.62±5.17 years. **Table:2.** Shows the gender distribution, male subjects in our study were 226 as compare to female 142 out of 368. In Case group male were 122 and female 62, while in control group non users 104 male subjects and 80 female subjects. **Table:3.** Shows different types of areca nut and its products used by case group. Among areca nut users most of them 64 (34.8%) were using Gutkha, while 47(25.5%) using pan, supari user 43(23.4%) and mainpuri users

were 30 in number (16.3%).**Table:4.** Shows the comparison of frequency of arrhythmia among different types of areca nut products. In gutkha users there was 14 cases among 64 subjects 21.87%, in Pan users 9 cases among 47 users 19.15%, in supari users 5 cases among 43subjects 11.62%, and in mainpuri users 4 cases with arrhythmia among 30subjects 13.33%. **Table:5.** Shows different types of arrhythmia and their

Table.1: Age comparison in areca nut users and non users (n=368)

Total study subjects (n=368)	Areca nut and its products users (n=184)	Areca nut non user Control group (n=184)	P-value
Age(years) (Mean+ SD)	25.61±5.25	26.62±5.17	0.9

Table.2: Gender distribution of total study subjects(n=368)

Gender	Areca nut and its products users (n=184)	Areca nut non user Control group (n=184)
Male (226)	122	104
Female (142)	62	80
P-value	0.9	0.9

Table.3: Different types of areca products used by Case group areca nut and its products users(n=184)

Areca nut and its products	Frequency	Percentage
Gutkha	64	34.8%
Pan	47	25.5%
Supari	43	23.4%
Mainpuri	30	16.3%

Table.4: Comparison of changes in electrocardiogram among areca nut and its products users and non users.

Parameters (n=368)	Areca nut and its products Users (184)	Non users Control group (184)	P-value
Normal Electrocardiogram (No/percentage)	152/(82.61%)	166/(90.22%)	
Arrhythmias (No/percentage)	32/(17.39%)	18/(9.78%)	0.03

Table.05: Different types of arrhythmia in different types of areca nut and its products users

Differenttypes of Arrhythmia	Areca nut and its products users			
	Gutkha users	Pan users	supari users	Mainpuri users
Supraventricular tachycardia	5	3	2	2
Atrial fibrillation	4	2	1	1
Others Arrhythmia	5	4	2	1

mainpuri users. In gutkha users supraventricular tachycardia was present in 5 subjects, Atrial fibrillation in 4 and other arrhythmia in 5 subjects. Among pan users supraventricular tachycardia was present in 3 subjects, Atrial fibrillation in 2 and other arrhythmia in 4 subjects. In supari users supraventricular tachycardia was present in 2 subjects, Atrial fibrillation in 1 subject and 1 case of other arrhythmia. In mainpuri users supraventricular tachycardia was present in 2 subject, Atrial fibrillation in 1 subject and 1 case of other arrhythmia.

DISCUSSION

This study was carried out to find the effect of areca nut or betal nut and its different forms like pan gutkha and mainpuri on Electrocardiogram. Most researchers studied the local carcinogenic effect of areca nut but this one is unique study in our country as it has evaluate systemic cardiovascular effect of areca nut. The age in both groups was biostatically non significant. Case group subjects were with age 25.61±5.25years, and mean age of non-users control group was 26.62±5.17 years with p-value 0.9 **(Table:1)**. This study evaluated the major

effect of areca nut and its products on electrocardiogram effect shown in **Table:4.** The frequency of changes in electrocardiogram in both groups shown that abnormal heart rhythm or arrhythmia was found in 32 cases 17.39% in case group areca nut and its products users, while in control group non users it was present in 18 subjects 9.78%. The most frequent type of arrhythmia in areca nut users wassupraventricular tachycardia as there were 12 cases of supraventricular tachycardia, 8 with atrial fibrillation and 12 others (premature ventricular contraction, sinus bradycardia and sinus tachycardia). In non-users control group 7 subjects with supraventricular tachycardia. 3 cases of atria fibrillation and 8 others (premature ventricular contraction, sinus bradycardia and sinus tachycardia). In agreement with our study Tsai W-C et al (2013) studied risk of atrial fibrillation and its relation with areca nut chewing in Taiwan, and concluded that atrial fibrillation is the arrhythmia which is independently associated with areca nut chewing[3]. In the same way Nelson BS et al (1999) also give in his research that cardiac arrhythmia is an important finding in areca nut users[14]. The mechanism of more frequent arrhythmia in areca nut and its users is due to arecoline, which up regulates COX-2, and also selective cholinomimetic activity in isolated guinea-pig atrium occurs due to areca nut crude extract was found, which may be suspected mechanism of arrhythmias[3]. In a case study a 28yrs old man suffered palpitations, pain upper abdomen, and chest distress following consumption of 4 betel quid. On performing ECG paroxysmal supraventricular tachycardia was noted[15].

Atrial fibrillation is a type of cardiac arrhythmia which is frequently related with hypertension, coronary heart disease, and cardiac failure, its prevalence is increasing not only among elderly people but also in young. Atrial fibrillation is a risk "marker" for stroke and that the increased stroke incidence in persons with this arrhythmia is a result of associated cardiovascular abnormalities[16].

CONCLUSION

It is concluded that habit of chewing of areca nut and its products adversely affects cardiovascular system. The areca nut and its products change the rhythm of heart. There is increased frequency of cardiac arrhythmia in areca nut users as there were 32 cases of abnormal rhythm 17.39%, as compare to 18 cases 9.78% in control group.

RECOMMENDATIONS

It is recommended that areca nut and its products like pan, gutkha, supari and mainpuri should be consider as a cause of cardiac arrhythmia by health care providers. It is suggested that national policy should be made to ban products of areca nut throughout the country to decrease the burden of cardiovascular diseases.

ETHICS APPROVAL: The ERC gave ethical review approval

CONSENT TO PARTICIPATE: written and verbal consent was taken from subjects and next of kin

FUNDING: The work was not financially supported by any organization. The entire expense was taken by the authors

ACKNOWLEDGEMENTS: We would like to thank the all contributors and staff and other persons for providing useful information.

AUTHORS' CONTRIBUTIONS: All persons who meet authorship criteria are listed as authors, and all authors certify that they have participated in the work to take public responsibility of this manuscript. All authors read and approved the final manuscript.

CONFLICT OF INTEREST: No competing interest declared.

REFERENCES:

1. Laslett LJ, Alagona P, Clark BA, Drozda JP, Saldivar F, Wilson SR, et al. The worldwide environment of cardiovascular disease: prevalence, diagnosis, therapy, and policy issues: a report from the American College of Cardiology. Journal of the American College of Cardiology. 2012;60(25):S1-S49.
2. Lin W-Y, Chiu T-Y, Lee L-T, Lin C-C, Huang C-Y, Huang K-C. Betel nut chewing is associated with increased risk of cardiovascular disease and all-cause mortality in Taiwanese men. The American journal of clinical nutrition. 2008;87(5):1204-11.
3. Tsai W-C, Chen C-Y, Kuo H-F, Wu M-T, Tang W-H, Chu C-S, et al. Areca nut chewing and risk of atrial fibrillation in Taiwanese men: a nationwide ecological study. International journal of medical sciences. 2013;10(7):804.
4. Gupta P, Ray C. Epidemiology of betel quid usage. Annals-Academy of Medicine Singapore. 2004;33:31-6.
5. Warnakulasuriya S, Trivedy C, Peters TJ. Areca nut use: an independent risk factor for oral cancer: The health problem is

under-recognised. BMJ: British Medical Journal. 2002;324(7341):799.

6.https://notablelife.com/media/2015/10/27628649-Ripe-and-Raw-Betel-Nut-Or-Areca-Nut-Palm-On-Tree-Stock-Photo.jpg.

7. Sarfaraz M, Ali A, Mirza T. Prevalence and characteristics of areca nut chewing habit among school going children in Karachi. Journal of Dow University of Health Sciences. 2014;8(3).

8. Verma S. Areca nut (betel nut) chewing: a popular Indian cultural practice and its mucosal implications. International journal of dermatology. 2011;50(2):229-32.

9. Zaidi N, Memon M, Mazhar S, Mirza D. Frequency of betel nut chewing among non-teaching staff of Bahria university medical and dental college. Pakistan Oral& Dental Journal. 2016;36(4).

10. Khawaja M, Mazahir S, Majeed A, Malik F, Merchant K, Maqsood M, et al. Chewing of betel, areca and tobacco: perceptions and knowledge regarding their role in head and neck cancers in an urban squatter settlement in Pakistan. Asian Pacific Journal of Cancer Prevention. 2006;7(1):95.

11. Dongre A, Deshmukh P, Murali N, Garg B. Tobacco consumption among adolescents in rural Wardha: where and how tobacco control should focus its attention? Indian J Cancer 2008;45:100-106.

12. Pillai R, Balaram P, Reddiar KS. Pathogenesis of oral submucous fibrosis. Relationship to risk factors associated with oral cancer. Cancer. 1992;69:2011–2020.

13. Mazahir S, Malik R, Maqsood M, Merchant KA, Malik F, Majeed A, et al. Socio-demographic correlates of betel, areca and smokeless tobacco use as a high risk behavior for head and neck cancers in a squatter settlement of Karachi, Pakistan. Substance abuse treatment, prevention, and policy2006;1(1), p.10.

14. Nelson BS, Heischober B. Betel Nut: A Common Drug Used by Naturalized Citizens From India, Far East Asia, and the South Pacific Islands. Annals of Emergency Medicine. 1999 Aug 1;34(2):238-43.

15. Chiang WT, Yang CC, Deng JF, Bullard M. Cardiac arrhythmia and betel nut chewing--is there a causal effect?. Veterinary and human toxicology. 1998 Oct;40(5):287-9.

16. Wolf PA, Abbott RD, Kannel WB. Atrial fibrillation as an independent risk factor for stroke: the Framingham Study. Stroke. 1991 Aug; 22(8):983-8.