

## Study of Demography of First Thousand Patients Who Underwent Coronary Angiography-Retrospective Study

Ravi Vishnu Prasad<sup>1</sup>, Nirav Kumar<sup>2</sup>, Nishant Tripathi<sup>3</sup>, B.P. Singh<sup>4</sup>

<sup>1</sup> Additional Professor, Department of Cardiology, Indira Gandhi Institute of Medical Sciences, Patna, Bihar, India.

<sup>2</sup> Additional Professor, Department of Cardiology, Indira Gandhi Institute of Medical Sciences, Patna, Bihar, India.

<sup>3</sup> Associate Professor, Department of Cardiology, Indira Gandhi Institute of Medical Sciences, Patna, Bihar, India.

<sup>4</sup> Professor, Department of Cardiology, Indira Gandhi Institute of Medical Sciences, Patna, Bihar, India.

---

Received: 25-01-2022 / Revised: 23-02-2022 / Accepted: 26-03-2022

Corresponding author: Dr. Nirav Kumar

Conflict of interest: Nil

---

### Abstract

**Background:** CAD is very much prevalent in developing country. Our study is unique, first time done in province of Bihar to determine correlation between significant coronary artery disease and risk factors particularly chewable tobacco which is unique in Bihar and adjacent state. We also studied demographic features of coronary artery. It is a retrospective study done between February 2015 to July 2016 at IGIMS, Patna

**Material and Method:** All first 1000 patients who underwent coronary angiography systemically analyze for significant coronary artery disease, anatomical variation. These results were correlated with risk factor, which is established, also include oral tobacco.

**Result:** among all patients 74 % were male, 29% were diabetic, 55% were hypertensive, 7% were smoker, 32% were taking tobacco chewer. 54% patient were suffering from significant coronary artery. Anomalous coronary artery was present in 2%. RCA dominance was seen in 91%, LCX in 7% and codominance in 2%. Muscle bridge was present in 1% case.

**Discussion:** All risk factors were significantly associated with CAD but strength of association between oral chewable tobacco with CAD was more in comparison to smoking.

---

This is an Open Access article that uses a fund-ing model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

---

### Introduction

After control of infectious disease cardiovascular disease is now the most common cause of death in developing country like India. [1] Historically described increase in death rate because of cardiovascular disease from 0.1% in 1910 to 0.2% 1925 in Massachusetts General

hospital in England. [2] Similarly in India classical description in cad incidence by padmavat et al in 1958 was related with incidence of CAD was 4 % In high socioeconomic group in contrast 0.5% in rural population of Nazafgarh and 0.17 % in industrial workers. When we see it in

recent prospect [3] gupta et al has claim in 2009 that India is large and socioeconomically diverse country, there could be evidence of all stage of their transition in the country. one important observation by [4] Harikrisnan et al was regarding western population only 23 % CVD occur before age of 70 years, in India this number is 52 %. So, incidence of CVD was much earlier than western population. There is enough evidence in favor of increase mayhem by cardiovascular disease as reported by registrar general of India that CHD led to 17% of total deaths and 26% of adult deaths in 2001-2003, which increased to 23% of total and 32 % of adult death in 2010-2013. [5] When we compare overall cardiovascular contribution 28.1% of total death as 14.1% of total disability adjusted life-years in India in 2016 compare with 15.2 and 6.9% respectively in 1990. So, burden almost double in 16 years. [6] It was being observe that ischemic heart disease is most leading cause of death in top 15 case of death. DALY {disability adjusted life span} rate because of ischemic heart disease is more in urban area. [3] India is witnessing rapid economic growth leading to increase incidence of coronary artery disease but because of vast nature of the country and economical diversity in the society, there is sizable population of poor, India is passing through different epidemiological transitions. Stage of receding pandemics, degenerative and manmade diseases and delayed degenerative diseases can be seen in the same population. There is wide intra-state variation in economy and healthcare is present. Bihar is best example of economic diversity in India because of relatively weaker economic condition and health infrastructure. So Coronary heart disease is the predominant cause of death in India. [7] Symptom of CHD arises 5 to 10 years earlier in India than in western Europe and Latin American countries. we Indian suffer onslaught of CHD early in life, economically most productive years.

Coronary artery disease is taking epidemic proportion because of economical growth, lack of physical activity, smoking, DM, undiagnosed poorly controlled blood pressure associated with other risk factors of coronary heart disease. In epidemiological diagnosis of coronary artery disease and its correlation with risk factor is usually based on noninvasive tests. In present study, we correlate coronary heart disease with risk factor based on gold standard diagnostic coronary angiography. [8] First coronary angiography done accidentally by dr F Mason sone, on 30 oct 1958 and has changed the diagnosis and management of CAD dramatically.

Apart from established risk factors chewable tobacco is not thoroughly studied as a risk factor for CAD. Its use varies in different part of world in terms of quality, refinements and quantity. In Bihar it is commonly taken in form raw tobacco leaf with lime and kept between gum and lower lip for hours and called as khaini. It is frequently taken by lower and middle class and some time by upper class also. Consumption is socially accepted, frequently share by each other during social gathering. Other form of smokeless tobacco intake is gutka, gul and Jarda.

### Material and Methods

It is a retrospective study done between February 2015 to July 2016. After taking permission from ethical committee of Indra Gandhi Institute of Medical Sciences (IGIMS), the first thousand patients who underwent coronary angiography were studied. All the patient's records were evaluated, and all the patients were telephonically interviewed regarding risk factor. The angiography CD was reviewed by 2 independent operators.

Only those patients were excluded from the study in which telephonic interview was not possible or records were incomplete. [10,11] Coronary stenosis equal to or greater than 70%-80% were

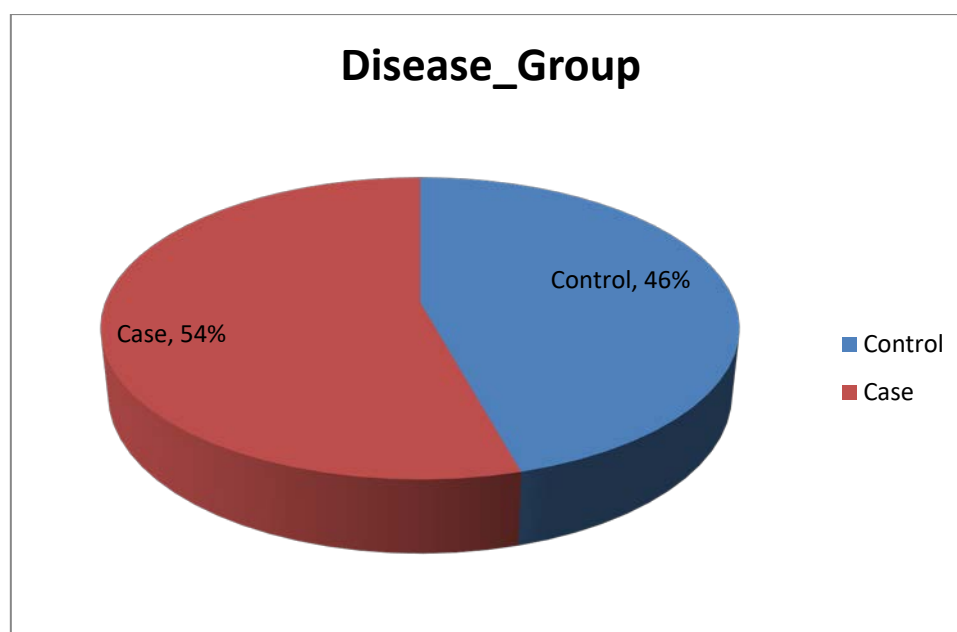
considered as significant coronary artery disease. anomalous coronary artery, muscle bridge, dominance pattern of coronary artery was also studied. All patient's record was evaluated as well as telephonically cross check for [9] risk factors of CAD like hypertension, diabetes, smoking and smokeless tobacco like khaini, gul, jarda. We took smoking and smokeless chewable tobacco separately. For with smoking and chewable tobacco, only those persons were labeled who were taking it frequently on daily basis and addicted with it. For hypertension only those persons were considered who were taking antihypertensive or blood pressure was constantly above 140/90 during hospital

stay. diagnosis of diabetes was considered if someone is taking antidiabetic drug or meet WHO criteria for type 2 diabetes.

Data analysis- data was express in number and percentage. Mean, median was derived. Analysis of data was done with chi square test, T test. P value was derived. Odd ratio was calculated. Strength of association with risk factors was derived. Statical analysis was done with SPSS software.

### Result

In our Retrospective study in total 1000 patients, 744 persons were male and 256 were female. After assessment of angiographic CD Total 543 patients were suffering from significant disease.



**Figure 1: Disease Group**

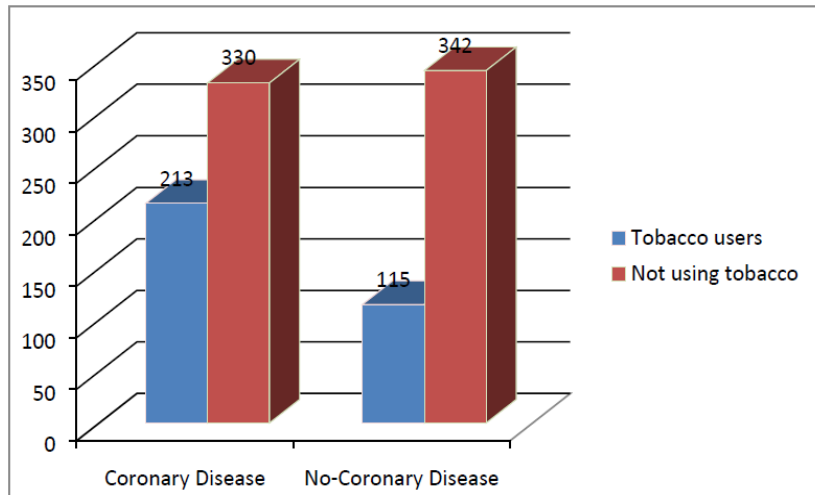
When we consider it sex wise Among total 744 male 439 were suffering from significant disease and among 256 female 104 were suffering from significant disease.

Total number of diabetes patients in the study were 297 and 203 diabetes were suffering from significant disease. In our study, hypertensive patients were 552

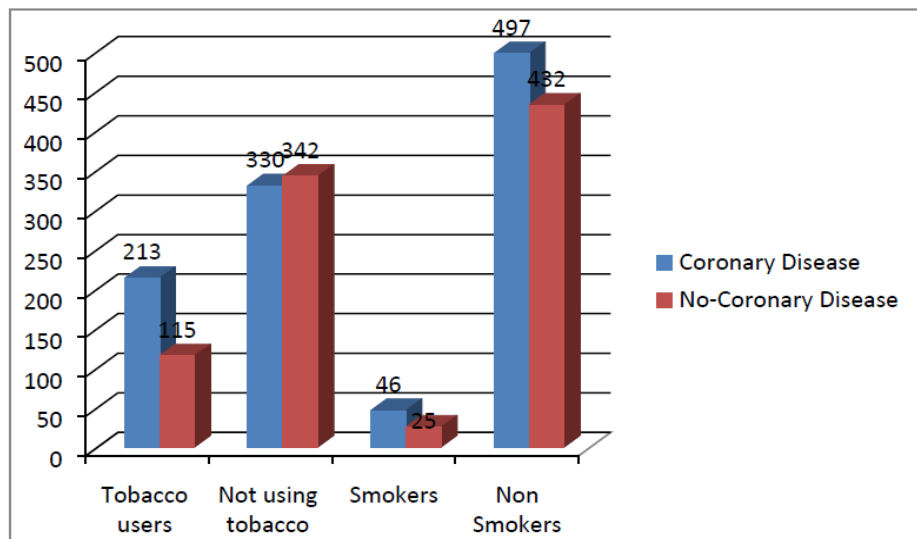
and 361 hypertensive patients were suffering from significant disease.

71 persons were smoker, which is 7.1 % of total patients and 46 were suffering from significant disease.

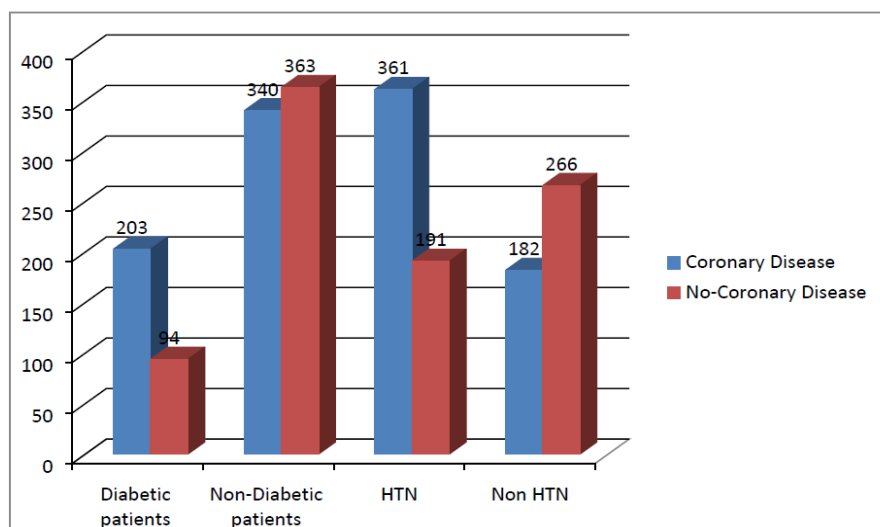
328 patients were taking tobacco which form 32.8 % of total group. 213 person who were taking smokeless tobacco had significant disease.



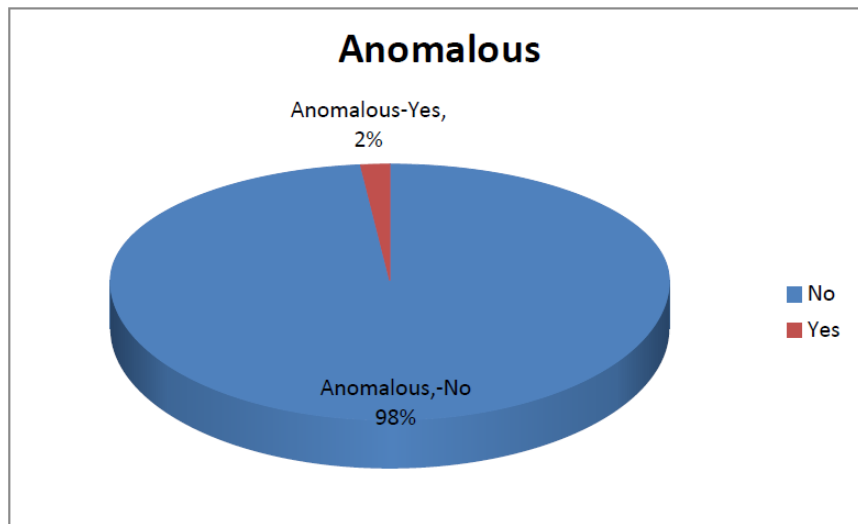
**Figure 2: Coronary disease and non coronary disease**



**Figure 3: Tobacco, non tobacco, smokers and non smokers.**



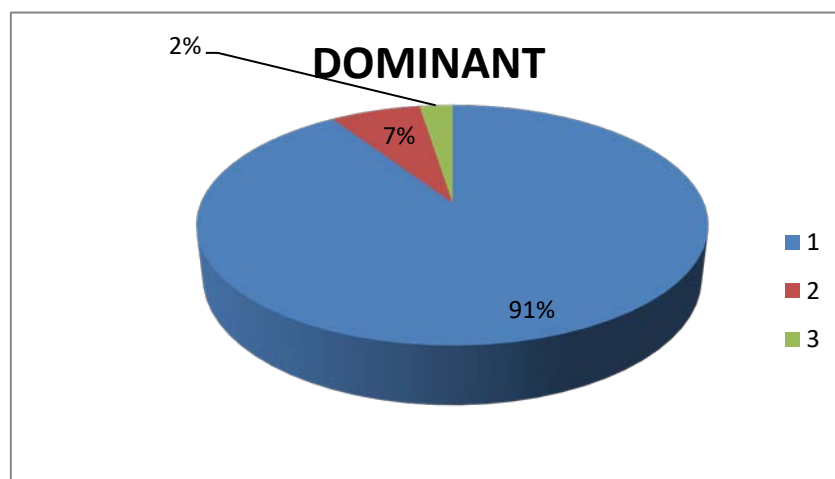
**Figure 4: Diabetic, non-diabetic, hypertensive and non-hypertensive patients**



**Figure 5: Anomalous**

After applying angelini criteria over all of anomalous artery incidence was 2%.

91% of patients RCA was dominant and 7% LCX artery and in 2% codominant system was present.



**Figure 6: Dominant**

After taking all risk factors odd ratio was estimated. All risk factors were significantly associated with coronary artery disease. strength of association

between risk factor and significant coronary artery disease was highest with hypertension, diabetes, tobacco and smoking in decreasing order.

**Variables in the Equation**

	B	S.E.		Wald	df	Sig.	Exp(B)		95.0% C.I. for EXP(B)	
		Lower	Upper				Lower	Upper	Lower	Upper
Step 1(a)										
DM(1)	.751	.152		24.263	1	.000	2.119	1.572	2.857	
HTN(1)	.988	.136		53.081	1	.000	2.685	2.059	3.503	
Smoking(1)	.253	.277		.832	1	.362	1.288	.748	2.218	
Tobacco(1)	.694	.150		21.413	1	.000	2.001	1.492	2.684	
Constant	-.814	.118		47.168	1	.000	.443			

a Variable(s) entered on step 1: DM, HTN, Smoking, Tobacco.

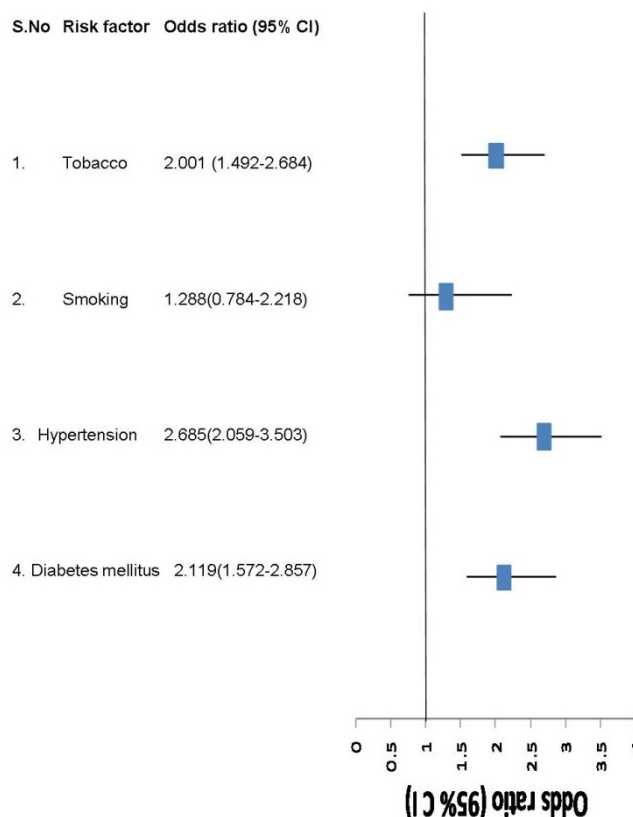


Figure 7: Variables in equations

**Discussion**

In first 1000 patients’ percentage of female was 25.6%. however in similar type of study [12,13] participation of female patient was in between 14-30%. This may be because of under reporting, less awareness, less referral, weaker socioeconomic condition, high threshold among cardiologist for invasive test in female.

Anomalous artery was present in 2 % of case. Incidence of anomalous artery varies between 0.8- 8.4%. in our study presence of anomalous artery was within range of other study12. Similarly, RCA was dominant in 91%, LCX dominance in 7% and codominance in 2%. RCA dominance was slightly high when we compare it with contemporary study 12.

muscle bridge was seen in 1% of case. Incidence of muscle bridge was similar to other study 12.

Some of the establish risk factors were also studied like hypertension, diabetes, smoking. smokeless tobacco was also included in our study. Smokeless tobacco is very commonly used in province of Bihar and surprisingly 32.8 % patients were taking smokeless tobacco in this study. Although our institute cater middle class and lower middle class income group. In the same time number of smokers in our study was 7.8 % only. [14] Prevalence of smoking and smokeless tobacco was similar to GATS data regarding India. Smokeless tobacco is freely available in Bihar, relatively cheap, free from any regulation on sale and related with cultural association of consumption during gathering. It is consumed most commonly in form of khaini. khaini is consumption of tobacco leaf with quick lime. Khaini is put between lower lip and gum. other form of consumption is gul, jarda, gutkha. Smokeless tobacco is clearly associated with oral cancer. Association of tobacco

with coronary artery disease is controversial. One large Swedish study [15] in which smokeless tobacco was studied failed to show any significant association with cv mortality. similarly, according to [16] Hergens et al snuff tobacco was not associated with increase cardiovascular mortality. In another large study by [17] Henley et al showed that significantly increase heart rate was associated with cv mortality among smokeless tobacco users. In meta-analysis of these [18] study failed to show any significant association between smokeless tobacco and cv mortality. In sub analysis of [19] INTERHEART study smokeless tobacco was significantly associated with risk of first MI. [20]

in our study smokeless tobacco was strongly associated with significant coronary artery disease. Strong Association may be because of heavy consumption, spit type of tobacco, unrefined variety, longer duration of use and unhealthy lifestyle in tobacco user. Majority of these user belong to low socioeconomic group, usually start taking tobacco in early age. They use to take tobacco under lip during day time and surprisingly some sleep with chewing tobacco. There is no social taboo attach with it.

Our study is unique in the sense that no similar study done in Bihar. In our knowledge no study done worldwide which correlate significant coronary artery disease angiographically with smokeless tobacco of spiting type. One interesting fact is majority of tobacco user is from economically weaker class, as our institute is government organization and treated people from economically deprived class. This is CAD paradox in which poor people get affected contrary to established fact may be because of smokeless tobacco.

Conclusion- other than established risk factor of CAD, we found significant coronary artery disease was associated with smokeless tobacco. Although it is

retrospective study, and it is difficult to established amount of tobacco consumed with extent of coronary artery disease. There is also limitation of visual assessment of coronary artery disease and nonsignificant artery stenosis was also omitted. Large prospective study requires to further clarify the fact which arise from this study and prevent CAD epidemic which is now affecting the poor also.

**Funding: No**

**Ethical committee: approved**

### References

1. Heart disease and disorder in new England Paul D white, American heart journal, volume 3, issue 3, Feb 1928, page 302-318
2. Padmavat S, Gupta S and pantule G V A Dietary fat, serum cholesterol level and incidence of atherosclerosis and hypertension in delhi, Indian J M Research 46,245,1958
3. Gupta R, Gupta K D, Coronary heart disease in low socioeconomic state subject in india as evolving epidemic, Indian heart journal 2009, 61, 358-67
4. Harikrishnan S, Leeder S, Huffman M, Jemon P, Prabhakar D, A Race against time, the challenge of cardiovascular disease in developing economies, 2<sup>nd</sup> ed, New Delhi, India, New Delhi centre for chronic disease control 2014
5. Lancet global health December 01,2018:6, issue 12, e1339-51
6. National burden estimate of healthy life lost in India, 2017 analysis using direct mortality data and indirect disability data Lancet, Global health 2019, e1675-84
7. Prabhakaran D, Singh K. premature coronary heart disease risk factor and reducing the CHD burden in India. Indian J med res. 2001; 134:8-9
8. Modern concepts of cardiovascular disease, 31 (1962), pp. 735-738.
9. Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries {the

- interheart study}, Lancet 2004;364, 937-52
10. The Prognostic Significance of 50% Coronary Stenosis in Medically Treated Patients with Coronary Artery Disease Phillip J. Harris, Mb., D. Phil., Victor S. Behar, M.D., Martin J. Conley, M.D., Frank E. Harrell, Jr., Ph.D., Kerry L. Lee, Ph.D., Robert H. Peter, M.D., Yihong Kong, M.D., And Robert A. Rosati, M.D, Circulation 62, No. 2, 1980.
  11. Survival in medically treated coronary artery disease Harris PJ, Harrell FE, Lee KL, Behar VS, Rosati RA:Circulation 60: 1259, 1979
  12. Demographic Profile, Clinical Presentation & Angiographic Findings in 637 Patients with Coronary Heart Disease Faridpur Med. Coll. J. 2011;6(2):82-85
  13. Coronary anatomy, anatomic variations and anomalies: a retrospective coronary angiography study Cihan Altin1, MD, Suleyman Kanyilmaz1,. Singapore Med J 2015; 56(6): 339-345
  14. Global Adult Tobacco Survey FACT SHEET | INDIA 2016-17
  15. Huhtasaari F, Asplund K, Lundberg V, Stegmayr B, Wester PO. Tobacco and myocardial infarction: is snuff less dangerous than cigarettes? BMJ. 1992; 305:1252–1256.
  16. Hergens MP, Ahlbom A, Andersson T, Pershagen G. Swedish moist snuff and myocardial infarction among men. Epidemiology. 2005;16: 12–16. .
  17. Henley SJ, Thun MJ, Connell C, Calle EE. Two large prospective studies of mortality among men who use snuff or chewing tobacco (United States). Cancer Causes Control. 2005; 16:347–358.
  18. Impact of Smokeless Tobacco Products on Cardiovascular Disease: Implications for Policy, Prevention, and Treatment A Policy Statement from the American Heart Association, (Circulation. 2010; 122:1520-1544.)
  19. Teo KK, Ounpuu S, Hawken S, Pandey MR, Valentin V, Hunt D, Diaz R, Rashed W, Freeman R, Jiang L, Zhang X, Yusuf S, INTERHEART Study Investigators. Tobacco use and risk of myocardial infarction in 52 countries in the INTERHEART study: a case-control study. Lancet. 2006; 368:647–658.
  20. Anayo, N. K., Guinhouya, K. M., Apetse K., Agba, L., Assogba, K., Belo, M., & Balogou, K. A. Posterior Reversible Encephalopathy Syndrome. A case reports. Journal of Medical Research and Health Sciences, 2022;5(3), 1804–1807.