

Original Article

Incidence of Ischemic Heart Disease (IHD) in Smokeless Tobacco/Naswar Users versus Non-Users Following Coronary Interventions

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ABSTRACT

Background: Ischemic heart disease (IHD) is a significant health concern globally, with various risk factors affecting the outcomes of therapeutic interventions like percutaneous coronary interventions (PCIs) and coronary artery bypass grafting (CABG). The use of smokeless tobacco products such as SLT (snus, loose snuff) and Naswar is prevalent in South Asia and poses additional risks due to its cardiovascular implications.

Objective: This study aims to assess the impact of smokeless tobacco (SLT/Naswar) use on the incidence of IHD following coronary interventions, highlighting the need for tailored healthcare strategies to address this modifiable risk factor.

Methods: A prospective observational study was conducted from July 1, 2023, to January 1, 2024, involving 200 participants aged 18 to 80 years diagnosed with IHD. Data collection involved structured interviews and comprehensive reviews of health records. Statistical analyses included Chi-square tests and logistic regression to evaluate the association between SLT/Naswar usage and IHD incidence post-intervention, with SPSS software utilized for all computations.

Results: Among the participants, 40.5% were users of SLT/Naswar. Post-coronary intervention, SLT/Naswar users showed a 66% incidence rate of IHD compared to 48% in non-users, with a statistically significant difference ($P=0.032$). Successful intervention rates were 62% in SLT/Naswar users versus 78% in non-users. Complication rates such as re-stenosis were higher in SLT/Naswar users (29% vs. 16%).

Conclusion: The study demonstrates that SLT/Naswar use significantly impacts the outcomes of coronary interventions, with a higher incidence of IHD and complications among users. These findings underscore the importance of integrating smokeless tobacco cessation programs into cardiovascular care protocols.

Keywords: Ischemic Heart Disease, Smokeless Tobacco, Coronary Interventions, SLT, Naswar, Cardiovascular Risk, Intervention Success.**Introduction**

INTRODUCTION

Ischemic heart disease (IHD) is a major contributor to global morbidity and mortality, continuously prompting research into its risk factors and the optimization of therapeutic interventions (1). Key treatments for IHD include percutaneous coronary interventions (PCIs) and coronary artery bypass grafting (CABG), both of which aim to restore coronary blood flow and improve clinical outcomes (2). Despite the advancements in these procedures, their success is influenced by a combination of modifiable and non-modifiable risk factors. Among the modifiable risk factors, the use of smokeless tobacco products such as SLT (snus, loose snuff) and Naswar, which are especially popular in South Asia, is noteworthy. These products contain nicotine and other harmful substances that may heighten cardiovascular risks and adversely affect the results of coronary interventions (3). While the detrimental effects of smoking on heart health are well-established, the specific impact of smokeless tobacco and Naswar on post-intervention outcomes in IHD patients remains underexplored. This study aims to address this gap by examining the incidence of IHD in users of SLT/Naswar versus

non-users following coronary interventions. The research is designed to underline the significance of addressing local and lifestyle-specific risk factors within cardiovascular healthcare frameworks (4). Given the high prevalence of SLT/Naswar in certain regions and its potential to influence the efficacy of coronary interventions, this study is particularly relevant. It seeks to offer insights into how the usage of these products might affect intervention success and to emphasize the need for tailored strategies that mitigate this risk factor (5-7).

MATERIAL AND METHODS

This prospective observational study was conducted from July 1, 2023, to January 1, 2024, after obtaining ethical approval from the LRH-MTI Institutional Ethical Committee, adhering to the principles of the Declaration of Helsinki. The subjects were recruited from the inpatient and outpatient facilities of the cardiology department at LRH-MTI. The inclusion criteria encompassed individuals aged 18 to 80 years who had been diagnosed with ischemic heart disease, including acute coronary syndrome and chronic stable angina. Diagnoses were established based on clinical assessments supported by a suite of diagnostic tools, including electrocardiograms (ECG), cardiac enzyme tests, exercise tolerance tests, echocardiograms, cardiac SPECT scans, coronary CT angiography, CMR, and coronary angiograms. The study also included subjects who exhibited conventional and other atherosclerosis risk factors, particularly those using SLT/Naswar. Exclusion criteria applied to individuals who declined to participate, those outside the age range, and patients with conditions that could confound the analysis, such as significant valvular heart disease, life-threatening malignancies, or those undergoing long-term hemodialysis (8-12).

Data collection was systematically executed through structured interviews and a thorough review of health practitioners' records. Periodontal disease susceptibility was assessed using the Questionnaire-based Community Periodontal Susceptibility Screening Index, which classifies periodontal disease susceptibility into categories of low/mild or moderate. All participants provided informed consent, ensuring they understood the study's scope and their involvement (13-16).

Statistical analyses were performed using SPSS software (version 25.0, SPSS Inc.). Descriptive statistics, including percentages, proportions, means, and standard deviations, were computed to describe demographic and clinical characteristics of the study population. The association between SLT/Naswar use and the incidence of IHD post-coronary intervention was analyzed using the Chi-square test, while the strength of these associations was quantified through odds ratios (ORs) with 95% confidence intervals, derived from logistic regression models. Differences between means were evaluated using Student's t-test, with significance levels set at not significant ($P > 0.05$), significant ($P < 0.05$), highly significant ($P < 0.01$), and very highly significant ($P < 0.001$).

RESULTS

The study encompassed a total of 200 participants, with the majority falling into the older age group of 51-90 years, accounting for 71% of the total population (Table 1). This indicates a significant representation of elderly individuals in the study, reflective of the higher prevalence of ischemic heart disease within this demographic. The gender distribution was notably skewed, with males comprising 86.5% of the study cohort, highlighting a predominant male participation (Table 1).

Table 1: Baseline Demographics of Study Participants

Variable	Frequency	Percentage (%)
Age Group (years)		
25-50	58	29.0
51-90	142	71.0
Gender		
Male	173	86.5
Female	27	13.5

Table 2: Prevalence of SLT/Naswar Usage

SLT/Naswar Usage	Frequency (n)	Percentage (%)
Users	81	40.5
Non-Users	119	59.5
Total	200	100.0

Table 3: Incidence of IHD Post-Coronary Intervention Among SLT/Naswar Users and Non-Users

SLT/Naswar Usage	IHD Incidence	Total Patients
Users	53 (66%)	81
Non-Users	57 (48%)	119
P-value	0.032	Statistically Significant Difference

Table 4: Outcomes Post-Coronary Intervention

Outcome Metrics	SLT/Naswar Users	Non-Users
Successful Intervention	62%	78%
Complications (e.g., Re-stenosis)	29%	16%
Repeat Interventions	34%	18%

In terms of smokeless tobacco use, SLT/Naswar users constituted 40.5% of the study sample, demonstrating a considerable portion of participants engaging in this risk behavior (Table 2). Non-users of SLT/Naswar made up 59.5%, establishing a control group for comparative analysis of the incidence rates of ischemic heart disease post-coronary interventions.

The incidence of ischemic heart disease post-coronary intervention revealed significant differences between SLT/Naswar users and non-users. Among the SLT/Naswar users, 66% experienced IHD incidents post-intervention compared to 48% of non-users (Table 3). This statistically significant difference, denoted by a P-value of 0.032, underscores the potential impact of SLT/Naswar usage on the outcomes of coronary interventions (Table 3).

Regarding the success of the interventions, 62% of SLT/Naswar users had successful outcomes compared to a higher success rate of 78% among non-users (Table 4). This disparity not only highlights the negative influence of SLT/Naswar usage on the efficacy of coronary interventions but also points to the need for targeted healthcare strategies to mitigate these risks. Furthermore, the rates of complications such as re-stenosis were higher among SLT/Naswar users at 29%, compared to 16% among non-users (Table 4). Additionally, the requirement for repeat interventions was more prevalent in SLT/Naswar users, with 34% needing further procedures, as opposed to 18% of non-users, indicating a poorer prognosis in this group (Table 4).

These findings collectively suggest that SLT/Naswar usage significantly affects the clinical outcomes of patients undergoing coronary interventions, underscoring the importance of integrating lifestyle modifications into the management strategies for ischemic heart disease.

DISCUSSION

This study explored the incidence of ischemic heart disease (IHD) in users of smokeless tobacco (SLT/Naswar) compared to non-users following coronary interventions. A significant finding was the higher incidence of IHD in SLT/Naswar users (66%) versus non-users (48%) post-intervention. These results align with existing research suggesting that the components of smokeless tobacco may contribute to cardiovascular risk through mechanisms such as nicotine-induced endothelial dysfunction and the promotion of atherosclerotic processes (6). Furthermore, SLT/Naswar users exhibited a reduced success rate of coronary interventions and an increased incidence of procedural complications, such as re-stenosis. This supports previous studies that identified smokeless tobacco as a risk factor for poor cardiovascular outcomes, potentially due to its effects on blood pressure, lipid profiles, and systemic inflammation (7).

Comparative studies have shown that populations with high prevalence of smokeless tobacco use often experience poorer cardiac intervention outcomes (8). This emphasizes the global relevance of our findings and supports the integration of smokeless tobacco cessation programs into preoperative and postoperative care protocols. Routine screening for smokeless tobacco use in patients scheduled for coronary interventions could facilitate early identification of high-risk patients, enabling the implementation of strategies aimed at reducing associated risks (10). Such preventive measures, along with active management of cardiovascular risk factors, could significantly improve clinical outcomes for these patients (13-18).

The discrepancy in outcomes between different regions suggests variations in smokeless tobacco products used, healthcare systems, and patient management practices, as evidenced by studies like those by Foulds et al. (2021), which found slightly better outcomes for smokeless tobacco users in North America compared to South Asia (11). Furthermore, our results corroborate findings from Thakur et al. (2019), who reported an increased risk of coronary heart disease associated with smokeless tobacco use (12).

The study's strengths include its prospective design and the comprehensive assessment of cardiovascular outcomes following coronary interventions among smokeless tobacco users. However, it is constrained by its observational nature and the single-center design, which may limit the generalizability of the results to other settings or populations (13-17). Additionally, the reliance on self-reported data for SLT/Naswar usage might have introduced biases affecting the accuracy of the associations. Future research should

expand to multicentric studies with larger, more diverse populations to confirm these findings and investigate the physiological mechanisms underlying the observed effects. Investigating whether cessation of SLT/Naswar use prior to interventions affects outcomes would also be valuable (18-20).

CONCLUSION

In conclusion, the increased risk of IHD in SLT/Naswar users following coronary interventions highlights the significant influence of smokeless tobacco on the success rates of these procedures and subsequent cardiovascular health. The marked difference in IHD incidence between SLT/Naswar users and non-users underscores the critical need to integrate comprehensive tobacco cessation programs into cardiovascular care practices. Such initiatives could improve the outcomes of coronary interventions and address a modifiable risk factor prevalent in specific populations. Future research should focus on longitudinal studies and the benefits of cessation programs to further elucidate the impact of smokeless tobacco on post-intervention outcomes.

REFERENCES

1. World Health Organization. Cardiovascular Diseases (CVDs) [Internet]. WHO; 2020 [cited 2024 May 3]. Available from: [https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-\(cvds\)](https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds)).
2. Levine GN, Bates ER, Bittl JA, Brindis RG, Fihn SD, Fleisher LA, et al. 2016 ACC/AHA Guideline Focused Update on Duration of Dual Antiplatelet Therapy in Patients With Coronary Artery Disease. *J Am Coll Cardiol*. 2016;68(10):1082-115.
3. Piano MR, Benowitz NL, Fitzgerald GA, Corbridge S, Heath J, Hahn E, et al. Impact of Smokeless Tobacco Products on Cardiovascular Disease: Implications for Policy, Prevention, and Treatment: A Policy Statement From the American Heart Association. *Circulation*. 2019;140(19):e704-30.
4. Gupta R, Gurm H, Bartholomew JR. Smokeless Tobacco and Cardiovascular Risk. *Arch Intern Med*. 2017;167(17):1235-40.
5. Sutherland JE, Hoegh TB, Kolaja J, Sutherland J. Prevalence of Coronary Intervention in Smokeless Tobacco Users Admitted for Cardiac Catheterization. *Eur J Cardiovasc Prev Rehabil*. 2018;15(4):447-50.
6. Gupta R, Gurm H. Smokeless Tobacco and Cardiovascular Disease: More Evidence for Increased Risk. *J Am Coll Cardiol*. 2019;74(9):1302-5.
7. Khan A, Tansel A. Impact of Smokeless Tobacco on the Outcomes of Coronary Artery Bypass Grafting. *Am J Cardiovasc Drugs*. 2021;21(4):401-10.
8. Patel VH, Mahabee-Gittens M. Nicotine and Cardiovascular Disease. *Arch Intern Med*. 2020;180(3):345-52.
9. Prabhu A, Patel K. Regional Variations in the Impact of Smokeless Tobacco on Cardiovascular Mortality: Insights from a Global Analysis. *Cardiovasc Toxicol*. 2021;21(5):415-23.
10. Hajat C, Stein E, Ramstrom L, Shantikumar S, Polosa R. The health impact of smokeless tobacco products: a systematic review. *Harm reduction journal*. 2021 Dec;18:1-21.
11. Fitzgerald G, Piano MR. Prevention and Treatment Strategies in Patients Using Smokeless Tobacco: A New Frontier. *Circulation*. 2022;143(1):78-85.
12. Foulds J, Ramstrom L, Burke M, Fagerström K. Effect of Smokeless Tobacco (Snus) on Smoking and Public Health in Sweden. *Tob Control*. 2021;22(4):299-305.
13. Thakur JS, Prinja S, Bhatnagar N, Rana SK, Sinha DN, Singh PK. Cardiovascular Risks Associated with Smokeless Tobacco Use: A Systematic Review. *Lancet Oncol*. 2019;20(10):e546-54.
14. Saleem Z, Liaquat S, Syed M, Abbas Z, Amir A, Shahbaz NN. Prevalence of the Usage of Smokeless Tobacco in Patients Presenting With Stroke in a Tertiary Care Hospital. *Cureus*. 2022 Jan 9;14(1).
15. Jenkins WD, Matthews AK, Bailey A, Zahnd WE, Watson KS, Mueller-Luckey G, et al. Rural Areas are Disproportionately Impacted by Smoking and Smokeless Tobacco Use: A Call for Comprehensive Tobacco Control Policies. *Prev Med*. 2020;137:106123.
16. Shar GS, Saghir T, Hakeem A, Ishaq H, Kumar M, Khowaja S, Qayyum D. Impact of Smokeless Tobacco Use on Distribution of Vessel Involvement in Patients with Acute Myocardial Infarction. *Pakistan Heart Journal*. 2022;55(1):47-52.
17. Patel V, Singh AK. Public Health Implications of Smokeless Tobacco Varieties: An International Overview. *Nicotine Tob Res*. 2018;20(8):923-38.
18. Sharma R. Smokeless tobacco use among women of reproductive age and during pregnancy in low and middle income countries-distribution and sociocultural characteristics (Doctoral dissertation, University of York).
19. Eyiletlen C, Fitas A, Jakubik D, Czajka P, Mróz A, Czajkowska A, Witek K, Bakalarski W, De Rosa S, Postuła M, Małek ŁA. Alterations in circulating MicroRNAs and the relation of MicroRNAs to maximal oxygen consumption and intima-media thickness in ultra-marathon runners. *International Journal of Environmental Research and Public Health*. 2021 Jul 6;18(14):7234.

20. Lee PN, Hamling J. Systematic Review of the Relation Between Smokeless Tobacco and Non-Neoplastic Oral Diseases in Europe and the United States. *BMC Oral Health*. 2019;19(1):54.