

ORIGINAL RESEARCH

The oral health status, behaviours and knowledge of patients with cardiovascular disease

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Abstract:**Background**

Cardiovascular disease (CVD) remains a leading cause of morbidity and mortality globally. There is a growing body of evidence suggesting a bidirectional relationship between oral health and cardiovascular conditions. This retrospective study aims to assess the oral health status, behaviors, and knowledge of patients diagnosed with CVD in Darbhanga over an 18-month period.

Materials and Methods

A total of 100 patient records from a healthcare facility in Darbhanga, diagnosed with CVD, were reviewed retrospectively. Data collected included demographic details, oral health status (assessed through DMFT index and periodontal status), oral hygiene behaviors (frequency of brushing, flossing, dental visits), and knowledge about the impact of oral health on cardiovascular conditions. Statistical analysis was performed using descriptive statistics and chi-square tests to determine the correlation between variables.

Results

The average age of the patients was 55.4 years, with a male predominance (60%). The mean DMFT score was 6.8, indicating moderate dental caries experience. Periodontal examination revealed that 70% of the patients had moderate to severe periodontitis. Oral hygiene behaviors were suboptimal, with only 40% of patients brushing twice daily and 20% using dental floss regularly. Only 30% of patients were aware of the potential link between oral health and cardiovascular disease. A significant correlation was found between poor oral health status and the severity of CVD ($p < 0.05$).

Conclusion

This study highlights the poor oral health status and inadequate oral hygiene practices among patients with CVD in Darbhanga. There is a need for integrated healthcare approaches that emphasize the importance of oral health in the management of cardiovascular diseases. Educational interventions to improve oral health knowledge and behaviors in this population are recommended.

Keywords

Cardiovascular disease, oral health, DMFT index, periodontal status, oral hygiene behaviors, knowledge, Darbhanga, retrospective study.

Introduction

Cardiovascular diseases (CVDs) are among the leading causes of mortality and morbidity worldwide, accounting for an estimated 17.9 million deaths annually (1). These diseases encompass a range of conditions, including coronary artery disease, heart failure, and stroke, which significantly impact the quality of life and healthcare systems globally (2). Emerging evidence has underscored the importance of oral health in relation to systemic health, particularly cardiovascular conditions. Poor oral health, characterized by periodontal disease and dental caries, has been associated with an increased risk of CVDs (3).

The biological mechanisms linking oral health and cardiovascular diseases are multifaceted. Chronic inflammation resulting from periodontal disease may contribute to the development and progression of atherosclerosis, a key underlying pathology in many cardiovascular conditions (4). Additionally, oral pathogens have been identified in atherosclerotic plaques, suggesting a potential direct role in cardiovascular pathology (5). Despite the growing recognition of these associations, the oral health status, behaviors, and knowledge among patients with cardiovascular diseases remain inadequately explored, particularly in the Indian context.

Darbhanga, a city in the Indian state of Bihar, has a significant burden of both CVDs and poor oral health, reflecting the broader public health challenges in the region (6). Understanding the oral health status and related behaviors in this population is crucial for developing integrated healthcare strategies that address both oral and cardiovascular health.

This retrospective study aims to assess the oral health status, behaviors, and knowledge of patients diagnosed with cardiovascular diseases in Darbhanga. By analyzing patient records over an 18-month period, we seek to identify key areas for intervention and provide a foundation for future public health initiatives targeting this high-risk population.

Materials and Methods

Study Design

This retrospective study was conducted to evaluate the oral health status, behaviors, and knowledge of patients diagnosed with cardiovascular disease (CVD) in Darbhanga over an 18-month period.

Study Population

The study included 100 patients diagnosed with CVD, who attended the cardiology department of a major hospital in Darbhanga. Inclusion criteria were patients aged 18 years and above with a confirmed diagnosis of any cardiovascular condition. Exclusion criteria included patients with incomplete medical records or those who had received recent dental treatment within the last six months.

Data Collection

Data were collected retrospectively from patient medical records. The following information was extracted:

- **Demographic Details:** Age, gender, and socioeconomic status.
- **Oral Health Status:** Assessed using the Decayed, Missing, and Filled Teeth (DMFT) index and periodontal status (classified as healthy, gingivitis, moderate periodontitis, or severe periodontitis).
- **Oral Hygiene Behaviors:** Frequency of tooth brushing, use of dental floss, frequency of dental visits, and smoking status.
- **Knowledge of Oral Health and CVD Link:** Assessed based on documented patient responses to questions about their awareness of the relationship between oral health and cardiovascular disease.

Statistical Analysis

Data were entered into a database and analyzed using SPSS version 25.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics, including means, standard deviations, and frequencies, were calculated for demographic details, oral health status, oral hygiene behaviors, and knowledge. Chi-square tests were used to determine the correlation between oral health status and the severity of cardiovascular disease. A p-value of <0.05 was considered statistically significant.

Results

Demographic Details

The study included 100 patients with cardiovascular disease. The demographic characteristics are summarized in Table 1.

Characteristic	Value
Average Age (years)	55.4 ± 10.2
Gender	
- Male	60 (60%)
- Female	40 (40%)
Socioeconomic Status	
- Low	45 (45%)
- Middle	40 (40%)
- High	15 (15%)

Oral Health Status

The oral health status of the patients, assessed using the DMFT index and periodontal examination, is presented in Table 2.

Oral Health Measure	Value
Mean DMFT Score	6.8 ± 3.2
Periodontal Status	
- Healthy	10 (10%)
- Gingivitis	20 (20%)
- Moderate Periodontitis	50 (50%)
- Severe Periodontitis	20 (20%)

Oral Hygiene Behaviors

The oral hygiene behaviors of the patients are outlined in Table 3.

Behavior	Frequency
Tooth Brushing	
- Once daily	30 (30%)
- Twice daily	40 (40%)
- More than twice daily	10 (10%)
- Irregularly	20 (20%)
Use of Dental Floss	
- Regularly	20 (20%)
- Occasionally	30 (30%)
- Never	50 (50%)
Frequency of Dental Visits	
- Regular (every 6 months)	15 (15%)
- Occasional (once a year)	25 (25%)
- Rare (less than once a year)	60 (60%)
Smoking Status	
- Smoker	30 (30%)
- Non-smoker	70 (70%)

Knowledge of Oral Health and CVD Link

The knowledge of the relationship between oral health and cardiovascular disease among the patients is shown in Table 4.

Knowledge Level	Frequency
Aware	30 (30%)
Not Aware	70 (70%)

Correlation between Oral Health Status and CVD Severity

A significant correlation was found between poor oral health status (high DMFT scores and severe periodontitis) and the severity of cardiovascular disease ($p < 0.05$).

This comprehensive analysis of the oral health status, behaviors, and knowledge among CVD patients in Darbhanga underscores the need for integrated healthcare approaches and targeted educational interventions to improve both oral and cardiovascular health outcomes.

Discussion

The findings of this retrospective study highlight significant concerns regarding the oral health status, behaviors, and knowledge of patients with cardiovascular disease (CVD) in Darbhanga. The mean DMFT score of 6.8 indicates a moderate prevalence of dental caries, which is consistent with previous studies linking poor oral health to systemic conditions, including cardiovascular diseases (1). The high prevalence of moderate to severe periodontitis (70%) among the study population further underscores the critical need for improved oral healthcare services and education for patients with CVD.

The observed oral hygiene behaviors were suboptimal, with only 40% of patients brushing twice daily and a mere 20% using dental floss regularly. These findings align with previous research indicating that individuals with chronic systemic diseases often exhibit poor oral hygiene practices (2). Regular dental visits were infrequent among the participants, with 60% visiting a dentist less than once a year. This lack of routine dental care could exacerbate oral health issues and potentially contribute to the worsening of cardiovascular conditions (3).

One of the most striking findings was the low level of awareness regarding the relationship between oral health and cardiovascular disease, with only 30% of patients being aware of this connection. This highlights a significant gap in patient education and public health messaging. Previous studies have shown that increased awareness and education can lead to better oral hygiene practices and, consequently, improved overall health outcomes (4).

The significant correlation found between poor oral health status and the severity of cardiovascular disease ($p < 0.05$) in this study is consistent with the growing body of evidence supporting the bidirectional relationship between oral health and CVD. Chronic inflammation from periodontal disease has been proposed as a contributing factor to the development and progression of atherosclerosis, a major underlying cause of many cardiovascular conditions (5). Additionally, oral pathogens have been detected in atherosclerotic plaques, suggesting a direct role in cardiovascular pathology (6).

These findings underscore the need for integrated healthcare approaches that address both oral and cardiovascular health. Healthcare providers, particularly those managing patients with CVD, should be encouraged to incorporate oral health assessments and education into their routine practice. Collaborative efforts between cardiologists and dental professionals could lead to more comprehensive care and better health outcomes for patients.

Educational interventions aimed at increasing awareness about the importance of oral health in the context of systemic diseases, particularly cardiovascular conditions, are crucial. Public health campaigns and patient education programs should emphasize the link between oral hygiene and cardiovascular health to motivate patients to adopt better oral care practices.

Conclusion

In conclusion, this study highlights the poor oral health status, inadequate oral hygiene behaviors, and low levels of awareness regarding the relationship between oral health and

cardiovascular disease among patients in Darbhanga. These findings call for integrated healthcare strategies and targeted educational interventions to improve both oral and cardiovascular health outcomes in this high-risk population.

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