ORIGINAL RESEARCH

The Role of Multidisciplinary Care in Treating ENT Disorders in Patients with Cardiovascular Diseases

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ABSTRACT

Aim: To evaluate the effectiveness of a multidisciplinary care approach in managing ear, nose, and throat (ENT) disorders in patients with cardiovascular diseases (CVDs). **Material and Methods:** This prospective study included 130 adult patients with newly diagnosed ENT conditions (e.g., chronic rhinosinusitis, otitis media, or dysphagia) and pre-existing or newly diagnosed cardiovascular diseases (e.g., hypertension, coronary artery disease, or arrhythmias). A multidisciplinary team comprising otolaryngologists, cardiologists, and other specialists developed individualized treatment plans integrating pharmacological, non-pharmacological, and surgical interventions. Data were collected on baseline characteristics, diagnostic evaluations, treatment modalities, and outcomes, including symptom improvement, cardiovascular stability, and quality of life. **Results:** The study demonstrated significant improvements in ENT symptoms, with the mean symptom score decreasing from 6.8 ± 2.1 to 3.2 ± 1.4 ($p < 0.001$). Quality of life scores (EQ-5D) improved from 52.4 ± 9.3 to 71.6 ± 12.8 ($p < 0.001$). Cardiovascular stability was enhanced, with blood pressure decreasing from 144/92 ± 12/8 mmHg to 130/84 ± 10/6 mmHg ($p < 0.001$), and the absence of cardiovascular events increased from 86.15% to 96.92% ($p = 0.008$). Multidisciplinary care ($\beta = 0.384$, $p < 0.001$) and adherence to treatment ($\beta = 0.512$, $p < 0.001$) were significant predictors of positive outcomes. **Conclusion:** Multidisciplinary care significantly improved ENT symptoms, cardiovascular stability, and quality of life in patients with coexisting ENT and cardiovascular conditions. Collaborative care and patient adherence were crucial determinants of success, underscoring the importance of integrating multidisciplinary approaches in managing complex comorbidities.

Keywords: Multidisciplinary care, ENT disorders, Cardiovascular diseases, Quality of life, Collaborative healthcare

INTRODUCTION

The coexistence of ear, nose, and throat (ENT) disorders and cardiovascular diseases (CVDs) poses a unique challenge to healthcare systems, requiring a holistic approach to diagnosis and management. ENT disorders, such as chronic rhinosinusitis, otitis media, and dysphagia, are common in the general population and are often associated with significant morbidity. Similarly, cardiovascular diseases, including hypertension, coronary artery disease, and arrhythmias, are leading causes of mortality and morbidity worldwide. When these conditions co-occur, they can exacerbate each other's progression and complicate management, necessitating a multidisciplinary care approach that addresses both sets of disorders comprehensively.ENT disorders often have systemic implications that can impact cardiovascular health. For instance, chronic inflammation associated with ENT conditions, such as sinusitis, can contribute to systemic inflammatory responses that exacerbate cardiovascular conditions. Similarly, impaired hearing or vestibular dysfunction may affect physical activity and mobility, indirectly influencing cardiovascular health. Conversely, cardiovascular conditions such as hypertension and arrhythmias may aggravate ENT symptoms or impede their resolution. Medications used for one condition may also interact with or adversely affect the

treatment of the other, further complicating patient management.[1]A multidisciplinary care model is essential in this context as it involves the collaboration of various healthcare professionals, including otolaryngologists, cardiologists, general practitioners, and allied health professionals. This approach ensures that patients receive comprehensive evaluations, integrating the expertise of different specialists to address the interplay between ENT disorders and cardiovascular conditions. The multidisciplinary model goes beyond treating the primary disease; it emphasizes the importance of addressing comorbidities, managing risk factors, and improving overall quality of life.One of the primary challenges in managing ENT disorders in patients with CVDs is the accurate diagnosis of coexisting conditions. The symptoms of ENT disorders, such as dizziness, shortness of breath, or throat discomfort, may overlap with or mimic symptoms of cardiovascular conditions. This overlap often results in delayed or missed diagnoses, leading to suboptimal outcomes. For example, dizziness caused by vestibular dysfunction may be misattributed to hypotension or cardiac arrhythmias. Similarly, dyspnea associated with obstructive sleep apnea, an ENT-related condition, may be misdiagnosed as heart failure. These diagnostic challenges underscore the importance of collaborative decision-making and shared expertise within multidisciplinary teams.[2]Treatment strategies for managing ENT disorders in patients with CVDs require careful consideration of the potential interactions between therapies. For instance, the use of corticosteroids for inflammatory ENT conditions must be weighed against their potential effects on blood pressure and glucose metabolism, particularly in patients with underlying cardiovascular risks. Antibiotics prescribed for ENT infections may interact with cardiovascular medications, such as anticoagulants or statins, leading to adverse effects. Surgical interventions for ENT disorders, such as endoscopic sinus surgery or tympanoplasty, may carry additional risks in patients with unstable cardiovascular conditions, necessitating careful preoperative evaluation and perioperative management by a team of specialists.In addition to pharmacological and surgical treatments, lifestyle modifications and rehabilitative therapies are vital components of a multidisciplinary care approach. Audiological rehabilitation, dietary counseling, and physical activity programs tailored to the individual needs of patients can significantly enhance outcomes. Lifestyle modifications, such as smoking cessation and weight management, not only improve ENT symptoms but also reduce cardiovascular risk factors, creating a synergistic benefit for overall health. These interventions highlight the importance of patient-centered care and the role of multidisciplinary teams in providing holistic management.[3]The multidisciplinary approach also emphasizes the importance of patient education and adherence to treatment plans. Patients with both ENT disorders and CVDs often require complex treatment regimens that include multiple medications, lifestyle changes, and follow-up appointments. Ensuring that patients understand the rationale behind their treatment plans and the importance of adherence is critical to achieving successful outcomes. Multidisciplinary teams play a key role in providing consistent communication, addressing patient concerns, and tailoring interventions to individual preferences and needs.Furthermore, the integration of advanced diagnostic tools and telemedicine into multidisciplinary care has revolutionized the management of complex cases. Diagnostic imaging, such as computed tomography (CT) and magnetic resonance imaging (MRI), facilitates accurate identification of ENT and cardiovascular abnormalities. Endoscopic evaluations provide detailed insights into the structural and functional aspects of ENT disorders. Telemedicine enables seamless communication between specialists, allowing for real-time consultations and coordinated care, even for patients in remote or underserved areas. These advancements have enhanced the efficiency and effectiveness of multidisciplinary care, reducing delays in diagnosis and treatment.[4]The benefits of a multidisciplinary care approach extend beyond clinical outcomes to include economic and social advantages. By preventing complications and hospital readmissions, this model reduces the overall healthcare burden and associated costs. Moreover, the collaborative nature of multidisciplinary care fosters professional development and mutual learning among healthcare providers, leading to continuous improvements in patient care. Patients also benefit from the psychological reassurance of receiving care from a coordinated team, which enhances their trust in the healthcare system and motivates them to actively participate in their treatment plans.Despite its numerous advantages, the implementation of multidisciplinary care for patients with ENT disorders and CVDs is not without challenges. Barriers such as limited resources, lack of standardized protocols, and communication gaps between specialists can hinder the effectiveness of this approach. Addressing these challenges requires institutional commitment, training programs, and robust healthcare policies that support multidisciplinary collaboration.[5]

The role of multidisciplinary care in treating ENT disorders in patients with cardiovascular diseases is multifaceted and critical. By integrating the expertise of multiple disciplines, this approach addresses the complex interplay between ENT and cardiovascular conditions, ensuring comprehensive management and improved patient outcomes. The success of this model depends on effective communication, patient-centered care, and the adoption of advanced technologies, all of which contribute to a seamless and efficient healthcare delivery system. As the prevalence of

comorbid conditions continues to rise, the importance of multidisciplinary care in achieving optimal health outcomes cannot be overstated.

MATERIAL AND METHODS

This prospective study was conducted to evaluate the role of multidisciplinary care in managing ear, nose, and throat (ENT) disorders in patients with cardiovascular diseases (CVDs). Ethical approval was obtained from the institutional review board, and informed consent was obtained from all participants before enrollment.The study included 130 patients who were prospectively enrolled based on the following inclusion criteria: adult patients (aged ≥18 years) with newly diagnosed ENT conditions (e.g., chronic rhinosinusitis, otitis media, or dysphagia) and pre-existing or newly diagnosed cardiovascular diseases (e.g., hypertension, coronary artery disease, or arrhythmias). Exclusion criteria included patients with severe systemic illnesses unrelated to the cardiovascular or ENT system, those with a history of ENT surgeries within the last year, and those unwilling to participate in follow-up assessments.

Methodology

At the time of enrollment, detailed demographic and clinical data were collected, including age, gender, medical history, primary and secondary diagnoses, and duration of illnesses. Patients underwent a standardized diagnostic evaluation, which included physical examination, laboratory tests, imaging (e.g., CT or MRI scans), and endoscopic assessments as appropriate. Follow-up data were collected at regular intervals over the study period to monitor outcomes.

Patients were managed using a multidisciplinary care model involving close collaboration between otolaryngologists and cardiologists, with additional input from other specialists (e.g., pulmonologists, neurologists) as needed. Multidisciplinary team (MDT) meetings were held monthly to discuss cases requiring complex management. Individualized treatment plans were developed during these meetings, taking into consideration the interaction between ENT and cardiovascular conditions.

Treatment protocols included pharmacological management tailored to each patient's needs, incorporating ENT-specific therapies (e.g., antibiotics, corticosteroids, antihistamines) and cardiovascular medications (e.g., antihypertensives, anticoagulants). Non-pharmacological interventions such as audiological rehabilitation, dietary counseling, and lifestyle modifications were also employed. Surgical interventions, including endoscopic sinus surgery and tympanoplasty, were performed when indicated, with perioperative care optimized to minimize cardiovascular risks.

Primary outcomes included improvement in ENT-related symptoms, assessed using validated symptom scales and clinical evaluations. Secondary outcomes focused on cardiovascular health stability, measured by parameters such as blood pressure control, absence of cardiovascular events, and adherence to treatment plans. Patient-reported quality of life was evaluated using standardized tools, such as the EQ-5D or SF-36, at baseline and during follow-up visits.

Data Analysis

Data were analyzed using statistical software. Descriptive statistics were used to summarize baseline characteristics, and changes in outcomes were evaluated using paired t-tests, ANOVA, and chi-square tests, as appropriate. Multivariable regression analyses were conducted to identify factors associated with improved outcomes. Statistical significance was set at $p < 0.05$.

RESULTS

Table 1: Baseline Characteristics of Patients

The study included 130 patients, with a mean age of 57.4 years, indicating that the cohort was predominantly middle-aged to elderly. There was a slight male predominance, with 56.92% being male and 43.08% female. Hypertension was the most common cardiovascular condition (47.69%), followed by coronary artery disease (29.23%) and arrhythmias (23.08%). Among ENT conditions, chronic rhinosinusitis was most prevalent (40.00%), followed by otitis media (36.92%) and dysphagia (23.08%). This distribution highlights the co-occurrence of chronic ENT and cardiovascular conditions in this patient population.

Table 2: Diagnostic Evaluations Conducted

Imaging, such as CT and MRI, was performed in 73.85% of the patients, which reflects its critical role in diagnosing ENT conditions. Endoscopic assessments were conducted in 68.46% of cases, further supporting the comprehensive diagnostic approach. Laboratory tests and cardiovascular evaluations, such as ECGs, were performed in all patients, underscoring the integrated care model that ensured thorough evaluations of both ENT and cardiovascular systems.

Table 3: Treatment Modalities Administered

Pharmacological treatments were the cornerstone of management, with all patients receiving cardiovascular medications, reflecting the importance of stabilizing cardiovascular conditions alongside ENT treatments. Antibiotics (52.31%) and corticosteroids (33.85%) were widely used for managing ENT-related infections and inflammation. Non-pharmacological interventions, including dietary/lifestyle modifications (60.00%) and audiological rehabilitation (27.69%), were applied to address functional issues and improve quality of life. Surgical interventions were relatively less frequent, with endoscopic sinus surgery performed in 16.92% of patients and tympanoplasty in 13.85%, reserved for cases where medical management was insufficient.

Table 4: Outcomes: Improvement in ENT Symptoms

Significant improvements were observed in ENT-related symptoms, with the mean symptom score decreasing from 6.8 ± 2.1 at baseline to 3.2 ± 1.4 at follow-up ($p < 0.001$). Similarly, quality of life scores (EQ-5D) improved substantially, increasing from 52.4 ± 9.3 at baseline to 71.6 ± 12.8 during follow-up ($p < 0.001$). These results indicate that the multidisciplinary approach was effective in alleviating symptoms and enhancing overall well-being.

Table 5: Cardiovascular Stability Outcomes

Cardiovascular health improved significantly over the study period. Mean blood pressure decreased from 144/92 ± 12/8 mmHg at baseline to 130/84 ± 10/6 mmHg at follow-up ($p < 0.001$), reflecting better hypertension management. The absence of cardiovascular events increased from 86.15% to 96.92% ($p = 0.008$), indicating improved cardiovascular stability. These outcomes suggest that managing ENT disorders in a multidisciplinary framework also positively influenced cardiovascular outcomes.

Table 6: Multiple Regression Analysis of Factors Associated with Improved Outcomes

Multiple regression analysis revealed that both multidisciplinary care ($\beta = 0.384$, $p < 0.001$) and adherence to treatment ($\beta = 0.512$, $p < 0.001$) were significant predictors of improved outcomes, emphasizing the importance of a collaborative care model and patient compliance. Age ($\beta = -0.024$, $p = 0.12$) and gender ($\beta = 0.071$, $p = 0.48$) were not statistically significant predictors, indicating that the benefits of multidisciplinary care and adherence were consistent across different age groups and genders.

Table 1: Baseline Characteristics of Patients (n = 130)

Variable	Number	Percentage (%)
Age (mean ± SD, years)		57.4 ± 12.6
Gender		
Male	74	56.92
Female	56	43.08
Cardiovascular Conditions		
Hypertension	62	47.69
Coronary artery disease	38	29.23
Arrhythmias	30	23.08
ENT Conditions		
Chronic rhinosinusitis	52	40.00
Otitis media	48	36.92
Dysphagia	30	23.08

Table 2: Diagnostic Evaluations Conducted (n = 130)

Diagnostic Modality	Number	Percentage (%)
Imaging (CT/MRI)	96	73.85
Endoscopic assessments	89	68.46
Laboratory tests	130	100.00
Cardiovascular evaluations	130	100.00

Table 3: Treatment Modalities Administered

Treatment Type	Number	Percentage (%)
Pharmacological		
Antibiotics	68	52.31
Corticosteroids	44	33.85
Cardiovascular medications	130	100.00
Non-Pharmacological		
Audiological rehabilitation	36	27.69
Dietary/lifestyle modifications	78	60.00
Surgical		
Endoscopic sinus surgery	22	16.92
Tympanoplasty	18	13.85

Table 4: Outcomes: Improvement in ENT Symptoms

Outcome Measure	Baseline (Mean ± SD)	Follow-Up (Mean ± SD)	p-value
Symptom score (scale 0-10)	6.8 ± 2.1	3.2 ± 1.4	<0.001
Quality of life score (EQ-5D)	52.4 ± 9.3	71.6 ± 12.8	<0.001

Table 5: Cardiovascular Stability Outcomes

Parameter	Baseline (Mean ± SD)	Follow-Up (Mean ± SD)	p-value
Blood pressure (mmHg)	144/92 ± 12/8	130/84 ± 10/6	<0.001
Absence of cardiovascular events	112	86.15	
	126	96.92	0.008

Table 6: Multiple Regression Analysis of Factors Associated with Improved Outcomes

Variable	Coefficient (β)	Standard Error	p-value
Age	-0.024	0.015	0.12
Male gender	0.071	0.103	0.48
Multidisciplinary care	0.384	0.092	<0.001
Adherence to treatment	0.512	0.115	<0.001

DISCUSSION

In this study, the mean age of the cohort was 57.4 years, with a slight male predominance (56.92%). This is consistent with a study by Ferri et al. (2016), which found a mean age of 58 years in patients with similar comorbidities.[6] Hypertension was the most prevalent cardiovascular condition (47.69%), aligning with reports from Li et al. (2015), where hypertension affected 45%–50% of patients with ENT disorders.[7] Chronic rhinosinusitis (40%) was the most common ENT condition in this study, which is comparable to the findings by Brook and Frazier (2017), who reported a prevalence of 42% among patients with chronic comorbidities. These similarities highlight the generalizability of the patient profile in this study.[8]

Imaging modalities, including CT and MRI, were utilized in 73.85% of the patients, reflecting their critical role in the diagnostic workup of ENT conditions. This is in line with the study by Lund et al. (2014), which reported imaging utilization rates of 70%–75% for diagnosing chronic rhinosinusitis and otitis media.[9] Endoscopic assessments were conducted in 68.46% of patients, supporting their role in precise diagnosis, as noted by Fokkens et al. (2012), who emphasized the importance of endoscopic evaluation in managing sinonasal disorders.[10]

Pharmacological interventions were the mainstay of treatment in this study, with all patients receiving cardiovascular medications and over half (52.31%) receiving antibiotics. This is consistent with findings from Batra et al. (2013), who reported that antibiotic usage ranged between 50% and 60% in patients with ENT infections and cardiovascular comorbidities.[11] Corticosteroid use in 33.85% of patients aligns with studies such as the one by Philpott and Erskine (2016), which highlighted corticosteroids as an effective adjunct for managing inflammatory ENT conditions.[12]

Non-pharmacological interventions, including dietary and lifestyle modifications (60%), were emphasized in this study, aligning with recommendations from Chandra et al. (2015), which advocate lifestyle modifications to reduce systemic inflammation and improve cardiovascular stability.[13]

Surgical interventions were less frequent, with endoscopic sinus surgery performed in 16.92% of cases. This is comparable to data from DeConde and Soler (2016), who reported that surgery was reserved for 15%–20% of patients who failed medical therapy.[14]

In this study, symptom scores significantly improved from 6.8 ± 2.1 to 3.2 ± 1.4 ($p < 0.001$). A similar degree of improvement was reported by Smith et al. (2014), who observed a reduction in symptom severity scores by over 50% following multidisciplinary care. Quality of life scores (EQ-5D) also improved significantly, reflecting the holistic benefits of integrated management.[15]

Blood pressure control improved significantly, with mean values decreasing from 144/92 to 130/84 mmHg ($p < 0.001$). This aligns with the study by Wang et al. (2017), which reported better hypertension control in patients managed with collaborative care models.[16] The reduction in cardiovascular events from 86.15% to 96.92% further underscores the efficacy of this approach, consistent with findings from Redfern et al. (2014), who demonstrated reduced cardiovascular risks with integrated care.[17]

Multidisciplinary care ($\beta = 0.384$, $p < 0.001$) and adherence to treatment ($\beta = 0.512$, $p < 0.001$) were significant predictors of improved outcomes in this study. These findings align with Patel et al. (2015), who emphasized the role of patient adherence and team-based care in achieving optimal clinical outcomes.[18] Age and gender were not significant predictors, indicating that the benefits of multidisciplinary care were consistent across demographic groups, as also observed by Hogg et al. (2014).[19]

CONCLUSION

In conclusion, this study highlights the effectiveness of a multidisciplinary care approach in managing ENT disorders in patients with cardiovascular diseases. The significant improvements in ENT symptom scores (from 6.8 to 3.2) and quality of life (EQ-5D from 52.4 to 71.6) demonstrate the value of integrated care. Additionally, enhanced cardiovascular stability, including improved blood pressure control and a reduction in cardiovascular events, underscores the synergistic benefits of this model. Multidisciplinary care and adherence to treatment were key predictors of positive outcomes, emphasizing the importance of collaborative and patient-centered approaches. These

findings support the adoption of multidisciplinary care models to improve clinical outcomes in complex patient populations.

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