Original Article

Association Between ENT Disorders and Cognitive Decline Among the Elderly in Mirpur, AJK

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ABSTRACT

Objective: To evaluate the relationship between ENT disorders and cognitive decline in elderly individuals in Mirpur, AJK.

Study Design: cross-sectional study

Place and Duration of Study: This study was conducted at the Department of Community Medicine & ENT of DHQ Hospital & Medical College, Mirpur AJK from 1st October 2023 to 30th March 2024.

Methods: A cross-sectional study was thoroughly conducted involving 200 elderly participants from outpatient clinics in Mirpur, AJK. Comprehensive ENT evaluations were carefully performed to diagnose disorders such as hearing loss, tinnitus, and chronic rhinosinusitis. Cognitive function was systematically assessed using the Mini-Mental State Examination (MMSE). Data on demographic characteristics, comorbidities, and lifestyle factors were extensively collected. Statistical analysis, including Pearson correlation and multivariate regression, was rigorously used to assess the association between ENT disorders and cognitive decline.

Results: Hearing loss was predominantly identified as the most common ENT disorder, affecting 63% of participants, followed by tinnitus (36%) and chronic rhinosinusitis (21%). Cognitive decline (MMSE score <24) was noted in 48% of participants. A significant correlation between hearing loss and cognitive decline was strongly found ($r=0.59$, $p<0.001$), with a higher risk evidently observed in participants experiencing moderate-to-severe hearing loss (OR=3.4; 95% CI: 2.2–5.7). Tinnitus was also significantly associated with cognitive decline (OR=2.1; 95% CI: 1.2–3.3), while a weaker association was relatively observed with chronic rhinosinusitis (OR=1.3; 95% CI: 0.9–2.3).

Conclusion: ENT disorders, particularly hearing loss and tinnitus, are strongly associated with cognitive decline among the elderly in Mirpur, AJK. Early detection and management of these disorders may help mitigate the risk of cognitive impairment, emphasizing the need for integrated care strategies in aging populations.

Key Words: ENT disorders, cognitive decline, hearing loss

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INTRODUCTION

The aging process is often accompanied by a variety of sensory impairments, including hearing loss, tinnitus, and chronic rhinosinusitis. It has been found that these disorders significantly impact the quality of life of elderly individuals, with potential consequences for cognitive function.

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Hearing loss, the most prevalent sensory disorder among the elderly, has been shown to be associated with cognitive decline[1,5]. The relationship between sensory loss and cognitive impairment is considered critically important, as it may exacerbate the cognitive challenges that already accompany aging [2,9.] Tinnitus, commonly coexisting with hearing loss, has also been linked to cognitive deficits, including difficulties with attention and memory.[3,6]

Similarly, chronic rhinosinusitis, a condition affecting the upper respiratory system, has been suggested to influence cognitive function, although its precise impact remains somewhat unclear[4].

The role of hearing loss in cognitive decline has been examined in several studies, revealing that individuals with untreated or severe hearing impairment are at a higher risk for dementia and other forms of cognitive decline.[5,10] The pathways through which hearing loss contributes to cognitive deterioration are believed to include social isolation, reduced cognitive engagement, and neurobiological changes in the brain [6].Additionally,

tinnitus, often co-occurring with hearing loss, may serve as a chronic stressor, further contributing to cognitive impairment 7In terms of chronic rhinosinusitis, the persistent inflammation and discomfort associated with this condition have been suggested to influence mental well-being, potentially leading to cognitive decline in some elderly individuals.[8]

The relationship between ENT disorders—specifically hearing loss, tinnitus, and chronic rhinosinusitis—and cognitive decline in elderly individuals in Mirpur, AJK is aimed to be evaluated in this study. By exploring these associations, insight into how sensory impairments may exacerbate cognitive decline in this population is intended to be provided, emphasizing the importance of early detection and management of ENT disorders in aging individuals.

METHODS

A cross-sectional study was thoroughly conducted involving 200 elderly participants from outpatient clinics in Mirpur, AJK. Comprehensive ENT evaluations were carefully performed to diagnose disorders such as hearing loss, tinnitus, and chronic rhinosinusitis. Cognitive function was systematically assessed using the Mini-Mental State Examination (MMSE). Data on demographic characteristics, comorbidities, and lifestyle factors were extensively collected. Statistical analysis, including Pearson correlation and multivariate regression, was rigorously used to assess the association between ENT disorders and cognitive decline.

RESULTS

Hearing loss was predominantly identified as the most common ENT disorder, affecting 63% of participants, followed by tinnitus (36%) and chronic rhinosinusitis (21%). Cognitive decline (MMSE score <24) was noted in 48% of participants. A significant correlation between hearing loss and cognitive decline was strongly found ($r=0.59$, $p<0.001$), with a higher risk evidently observed in participants experiencing moderate-to-severe hearing loss (OR=3.4; 95% CI: 2.2–5.7). Tinnitus was also significantly associated with cognitive decline (OR=2.1; 95% CI: 1.2–3.3), while a weaker association was relatively observed with chronic rhinosinusitis (OR=1.3; 95% CI: 0.9–2.3).

Table No. 1: Prevalence of ENT Disorders in Study Participants

ENT Disorder	Prevalence (%
Hearing Loss	63%
Tinnitus	36%
Chronic Rhinosinusitis	21%

Table No. 2: Cognitive Decline (MMSE Score <24) in Participants

Cognitive Decline (MMSE <24)	Percentage (%
Cognitive Decline	48%
No Cognitive Decline	52%

Table No. 3: Correlation between Hearing Loss and Cognitive Decline

Hearing Loss Severity	Cognitive Decline (%)	Odds Ratio (OR)	95% Confidence Interval (CI)
Moderate-to-Severe Hearing Loss	Higher Risk (OR = 3.4)	3.4	2.2–5.7
Mild Hearing Loss	Lower Risk	N/A	N/A

Table No. 4: Associations between ENT Disorders and Cognitive Decline

ENT Disorder	Odds Ratio (OR)	95% Confidence Interval (CI)
Hearing Loss	3.4	2.2–5.7
Tinnitus	2.1	1.2–3.3
Chronic Rhinosinusitis	1.3	0.9–2.3

DISCUSSION

The results of this study were clearly found to confirm a significant association between ENT disorders and cognitive decline among the elderly population in Mirpur, AJK. Consistent with previous research, hearing loss was widely identified as the most common ENT disorder in this population, affecting 62% of participants. Moreover, hearing loss was strongly correlated with cognitive decline, with those experiencing moderate-to-severe hearing loss being at a particularly higher risk for cognitive impairment.[9] This finding clearly aligns with studies showing that the risk of dementia and other cognitive disorders is markedly increased by hearing loss [10]. Social isolation and decreased cognitive stimulation, both of which are key risk factors for cognitive decline, are believed to be caused by hearing impairment [11,12]. Additionally, it is thought that the central auditory processing changes that occur with hearing loss might contribute to broader cognitive deficits, particularly in areas of memory and executive function [13].

Tinnitus, which was found to affect 35% of participants in this study, was strongly associated with cognitive decline. This consistently supports previous research indicating that cognitive difficulties, such as impairments in attention, concentration, and memory, are frequently caused by tinnitus [14]. The chronic nature of tinnitus is believed to contribute to heightened stress levels, which in turn may impact cognitive function by

affecting the brain's neurobiological mechanisms . Although the physical discomfort caused by tinnitus often overshadows its cognitive consequences, these consequences are considered to deserve greater attention, as they may substantially compound the challenges already faced by elderly individuals.

Chronic rhinosinusitis, present in 20% of participants, was found to show a weaker association with cognitive decline compared to hearing loss and tinnitus. However, growing evidence suggests that chronic inflammatory conditions, including chronic rhinosinusitis, can have a detrimental effect on cognitive function [15]. It is believed that the persistent inflammation associated with rhinosinusitis may interfere with normal brain function, particularly in areas related to memory and cognitive processing. Additionally, cognitive decline may indirectly be contributed to by the chronic discomfort and possible comorbidities associated with rhinosinusitis through indirect pathways such as poor sleep quality and reduced physical activity.[16,18]

The importance of addressing ENT disorders in the elderly as part of a broader strategy to prevent or mitigate cognitive decline was emphasized by the study's findings. It is suggested that early detection and management of hearing loss and tinnitus may help reduce the associated risks of cognitive deterioration [18, 19]. Furthermore, it is believed that integrated care strategies addressing both sensory impairments and cognitive health could be significantly beneficial in improving the overall well-being of elderly individuals[20], emphasizing the need for regular ENT evaluations and cognitive screenings in aging populations.

CONCLUSION

In conclusion, this study is considered to contribute to the growing body of evidence linking ENT disorders, particularly hearing loss and tinnitus, with cognitive decline in the elderly. Given the significant association observed, it is deemed essential that early diagnosis, treatment, and management of these conditions be prioritized by healthcare systems to improve cognitive health outcomes in aging populations. Further longitudinal studies are needed to explore the causal mechanisms underlying these relationships and to assess the effectiveness of interventions in preventing cognitive decline among elderly individuals with sensory impairments.

Author's Contribution:

Concept & Design or acquisition of analysis or interpretation of data:	Amna Ahmed Noor, Farooq Ahmed Noor
Drafting or Revising Critically:	Faisal Bashir, Alyia Imtiaz, Ahmed Munir Qureshi, Tanveer Sadiq Chaudhry
Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

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