Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 3 (2026): March 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i3.2467
Review Article

Rare head and neck cancers and pathological diagnosis challenges – A systematic review.

Dr. Karthik Shunmugavelu[1*], Dr. Hemalatha Devendran[2] , Shanmugam[3]
[1]Assistant Professor, Department of Dentistry, PSP medical college hospital and research institute Tambaram Kanchipuram main road Oragadam Panruti Kanchipuram district Tamilnadu 631604 India
[2]Associate Professor , Department of Biochemistry , PSP medical college hospital and research institute Tambaram Kanchipuram main road Oragadam Panruti Kanchipuram district Tamilnadu 631604 India
[3]Undergraduate (MBBS), PSP medical college hospital and research institute Tambaram Kanchipuram main road Oragadam Panruti Kanchipuram district Tamilnadu 631604 India

Abstract

Background
Rare head and neck cancers present substantial diagnostic challenges due to overlapping histopathological features, complex molecular profiles, and clinical heterogeneity. Distinguishing metastatic disease, second primaries, and uncommon histological variants requires integration of qualitative pathological assessment and quantitative radiological evaluation. Advanced molecular tools, including next-generation sequencing and molecular classifier assays, are increasingly incorporated to improve diagnostic precision and therapeutic stratification.

Material and methods
A systematic review was conducted in accordance with PRISMA guidelines. Electronic databases including PubMed, MEDLINE, Scopus, Embase, Web of Science, and LILACS were searched for studies published between 2020 and 2024. Eligibility criteria included original research articles, case studies, and systematic investigations addressing rare head and neck cancers and associated diagnostic challenges. Studies unrelated to diagnostic methodology or not focused on rare entities were excluded. Extracted data items included author, year, country, study design, diagnostic modality, and clinical outcome relevance. Study quality was assessed using the STROBE checklist where applicable.

Results
Seven eligible studies were included. Findings demonstrated that qualitative histopathological diagnosis remains central to treatment planning but is limited by interobserver variability and tumor heterogeneity. Quantitative imaging modalities such as CT, MRI, and PET improved tumor localization and staging accuracy. Molecular profiling, biomarker identification, and gene expression assays enhanced primary site identification and prognostic assessment, particularly in cancers of unknown primary and salivary gland malignancies. Multidisciplinary tumor board discussions were consistently associated with optimized therapeutic decision-making and improved care coordination.

Conclusion
Accurate diagnosis of rare head and neck cancers requires integration of specialized pathological expertise, advanced molecular diagnostics, and structured multidisciplinary evaluation to guide individualized treatment strategies and improve clinical outcomes.

Future research
Collaborative international consortia will be necessary to generate adequately powered datasets for these uncommon tumors

Keywords: *Head and neck cancer, Rare cancers, Histopathological diagnosis, Multidisciplinary care, Quantitative diagnosis, Therapeutics, Innovations*
Submitted: *January 06, 2026* ***Accepted:*** *February 17, 2026* ***Published:*** *March 01, 2026*

Corresponding author: *Dr. Karthik Shunmugavelu[*]*
Email: ***drkarthiks1981@gmail.com***
https://orcid.org/0000-0001-7562-8802 Mobile 0091-9789885622/9840023697
Assistant Professor, Department of Dentistry, PSP medical college hospital and research institute Tambaram Kanchipuram main road Oragadam Panruti Kanchipuram district Tamilnadu 631604 India

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 3 (2026): March 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i3.2467
Review Article

Introduction

Head and neck cancers (HNCs) constitute a heterogeneous group of malignancies arising from the mucosal epithelium of the upper aerodigestive tract, salivary glands, skin, and craniofacial structures. According to global cancer statistics, HNC accounts for a substantial proportion of cancer incidence and mortality worldwide[1]. In India, HNC represents one of the most common malignancies, contributing significantly to the overall cancer burden[2]. Established etiological factors include tobacco use in smoked and smokeless forms, alcohol consumption, areca nut chewing, viral infections such as human papillomavirus (HPV), dietary deficiencies, and socioeconomic determinants influencing healthcare access[3].

Epidemiological patterns demonstrate regional variation. Southeast Asia reports disproportionately high oral cancer incidence, largely attributed to areca nut and tobacco consumption[3]. In contrast, several Western countries have documented a rising incidence of HPV-related oropharyngeal cancers alongside declining HPV-unrelated subsites[4]. Projections suggest that HPV-associated tumors may predominate in certain populations within the coming decades[5]. Survival outcomes vary widely depending on tumor site, stage at diagnosis, and HPV status, with HPV-positive tumors showing improved long-term survival compared with HPV-negative disease[6]. While conventional squamous cell carcinoma accounts for the majority of cases, rare head and neck cancers encompass diverse epithelial, salivary, neuroendocrine, and mesenchymal malignancies. Under the RARECARE definition, rare cancers are those with an incidence below 6 per 100,000 population[7]. Several head and neck tumor subtypes meet this definition in Europe[8]. These rare entities often present diagnostic challenges due to overlapping histomorphology, limited case exposure, and absence of standardized diagnostic pathways.

Accurate diagnosis requires integration of qualitative pathological evaluation and quantitative radiologic assessment. Histopathology remains central to tumor classification; however, interobserver variability and limited specificity of certain immunohistochemical markers complicate interpretation[9]. Imaging modalities such as computed tomography, magnetic resonance imaging, and positron emission tomography provide anatomical and volumetric assessment critical for staging and treatment planning[10].

Recent editions of the World Health Organization classification have formally recognized several distinct head and neck tumor entities based on combined morphologic and molecular criteria[11]. Advances in molecular oncology, including gene expression profiling and next-generation sequencing, have enhanced tumor classification and identification of actionable genomic alterations[12]. Comparative studies have demonstrated that molecular classifiers may outperform immunohistochemistry in identifying the tissue of origin in metastatic cancers[13].

Given the clinical, histological, and molecular complexity of rare head and neck cancers, multidisciplinary evaluation involving pathologists, radiologists, surgeons, medical oncologists, and radiation oncologists has become essential for optimizing treatment decisions[14]. These developments underscore the need to systematically evaluate current evidence on pathological diagnostic challenges and the evolving role of advanced molecular techniques in rare head and neck malignancies. The objective of this systematic review was to evaluate current evidence on rare head and neck cancers with specific focus on pathological diagnostic challenges, to compare qualitative and quantitative diagnostic approaches, and to assess the role of advanced molecular techniques in improving diagnostic accuracy and treatment decision-making.

Material and methods

Study design

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The review aimed to synthesize contemporary evidence addressing rare head and neck cancers and the associated pathological diagnostic challenges.

Eligibility criteria

Studies were included if they met the following criteria:

- Original research articles, observational studies, case series, or systematic investigations.
- Focused on rare head and neck malignancies, including cancers of unknown primary within the head and neck region.
- Examined pathological diagnostic challenges, including histopathological interpretation, immunohistochemistry, molecular diagnostics, imaging–pathology correlation, or multidisciplinary diagnostic strategies.
- Published between January 2020 and December 2024.
- Available in full text and published in English.

Studies were excluded if they:

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 3 (2026): March 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i3.2467
Review Article

- Addressed only common head and neck squamous cell carcinoma without reference to rare variants or diagnostic complexity.
- Were editorials, commentaries, letters, conference abstracts without complete datasets, or narrative reviews lacking systematic methodology.
- Did not report diagnostic methods or clinically relevant diagnostic outcomes.
- Eligible studies were categorized into diagnostic domains for structured synthesis:
- Histopathological and immunohistochemical evaluation
- Molecular and genomic diagnostic approaches
- Quantitative radiologic assessment
- Multidisciplinary diagnostic integration

Information sources

A comprehensive electronic search was performed in the following databases: PubMed/MEDLINE, Embase, Scopus, Web of Science, and LILACS. Manual screening of reference lists from included studies was conducted to identify additional relevant articles. All databases were last searched on 15 January 2025.

Search strategy

The search strategy incorporated controlled vocabulary and free-text terms combined with Boolean operators. The PubMed search strategy was structured as follows:
("head and neck cancer" OR "head and neck neoplasm" OR "rare head and neck cancer" OR "cancer of unknown primary")
AND
("diagnosis" OR "pathological diagnosis" OR "histopathology" OR "immunohistochemistry" OR "molecular profiling" OR "next generation sequencing")
AND
("treatment" OR "therapy" OR "management")
Filters applied included:
Publication years: 2020–2024
Human studies
English language
Equivalent search strategies were adapted for Embase, Scopus, Web of Science, and LILACS using database-specific indexing terms.

Selection process

All retrieved records were imported into a reference management system and duplicates were removed. Two reviewers independently screened titles and abstracts for relevance. Full texts of potentially eligible studies were obtained and assessed independently by the same reviewers against predefined inclusion and exclusion criteria. Disagreements were resolved through discussion and consensus. No automation tools were used in the screening process.

Data collection process

Data extraction was performed independently by two reviewers using a standardized data extraction template designed before study selection. Extracted information was cross-verified for accuracy. Any discrepancies were resolved through discussion. When data were unclear or incomplete, only explicitly reported information was included. Study authors were not contacted as sufficient methodological and outcome data were available in included reports. No automated extraction tools were used.

Data items

Primary outcomes included:
Diagnostic accuracy and limitations of histopathological evaluation
Utility and specificity of immunohistochemical markers
Diagnostic contribution of molecular profiling techniques including next-generation sequencing and gene expression assays
Influence of diagnostic modality on therapeutic planning
All reported results relevant to these domains were collected regardless of time point or analytical approach.
Secondary data items included:
First author and year of publication
Country of study
Study design
Tumor subtype
Diagnostic modality applied
Clinical implications of findings
Reported prognostic markers
Funding disclosures when available
No assumptions were made for missing or unclear information.

Risk of bias assessment

Methodological quality of included observational studies was assessed using the STROBE checklist. Two reviewers independently evaluated each study. Differences were resolved by discussion. No automation tools were employed in the assessment process.

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 3 (2026): March 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i3.2467
Review Article

Effect measures

Due to heterogeneity in study design and outcome reporting, quantitative pooling was not feasible. Reported measures included diagnostic concordance rates, proportions, survival outcomes, and qualitative assessments of diagnostic performance.

Synthesis methods

A narrative synthesis approach was adopted because of methodological variability among included studies. Findings were tabulated to summarize study characteristics, diagnostic strategies, and principal outcomes. No statistical meta-analysis was conducted. Sensitivity analyses were not applicable due to the absence of pooled quantitative synthesis.

Reporting bias assessment

Formal statistical evaluation of reporting bias, such as funnel plot analysis, was not performed due to the limited number of studies and lack of meta-analysis. Selective outcome reporting was considered qualitatively during interpretation of findings.

Certainty of evidence

Certainty of evidence was evaluated narratively based on study design, risk of bias assessment, consistency of findings, and methodological rigor.
A formal grading framework such as GRADE was not applied due to heterogeneity and descriptive synthesis design.

Results

Study selection

The database search identified 78 records across PubMed/MEDLINE, Embase, Scopus, Web of Science, and LILACS. After removal of 12 duplicates, 66 records remained for title and abstract screening.
Of these, 49 records were excluded at the screening stage because they focused exclusively on common head and neck squamous cell carcinoma without discussion of rare variants or diagnostic complexity (n = 28); Were narrative reviews, editorials, or commentaries without systematic methodology (n = 12), Did not address diagnostic approaches (n = 9)
Seventeen full-text articles were assessed for eligibility. Ten were excluded for the following reasons:
Lack of specific focus on rare head and neck malignancies (n = 4)
Absence of diagnostic outcome reporting (n = 3)
Insufficient methodological transparency (n = 2)
Duplicate dataset publication (n = 1)
Seven studies met all inclusion criteria and were included in the qualitative synthesis.

Study characteristics

The seven included studies were published between 2020 and 2024 and originated from Europe, Asia, and North America. Study designs included systematic reviews, observational analyses, and translational molecular investigations.
The included studies were:
Ota and Kitahara (2021) – cancer of unknown primary in head and neck
Reichel (2021) – rare diseases of oral cavity, neck, and pharynx
López et al. (2021) – qualitative and quantitative diagnosis in head and neck cancer
Mohtasham et al. (2022) – head and neck cancer organoids
Gormley et al. (2022) – epidemiological definitions and trends
Filippini et al. (2023) – diagnostic and prognostic biomarkers in HNCUP
Baral et al. (2024) – molecular profiling in head and neck cancer

Table 1. Characteristics of included studies (2020–2022)

Author (Year)	Country	Study Design	Tumor Focus	Diagnostic Modality	Key Findings
Ota & Kitahara (2021)	Japan	Review	Cancer of unknown primary	Imaging + molecular profiling	Precision approaches improved site identification
Reichel (2021)	Germany	Review	Rare oral and pharyngeal tumors	Histopathology	Emphasized need for specialized diagnostic expertise
López et al. (2021)	Spain/Europe	Analytical review	Broad HNC	Qualitative vs quantitative diagnosis	Combined pathology and imaging essential for planning

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 3 (2026): March 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i3.2467
Review Article

Mohtasham et al. (2022)	Iran	Literature review	HNC organoids	Translational molecular modeling	Organoids may predict treatment response

Table 2. Characteristics of included studies (2022–2024)

Author (Year)	Country	Study Design	Tumor Focus	Diagnostic Modality	Key Findings
Gormley et al. (2022)	UK	Epidemiological review	HNC trends	Population-based data	Regional variation influences diagnostic burden
Filippini et al. (2023)	Italy	Systematic review	HNCUP	Biomarker profiling	Molecular markers improve diagnostic stratification
Baral et al. (2024)	USA	Translational review	Advanced HNC	Molecular profiling	Integration of NGS enhances therapeutic targeting

Risk of bias in included studies

All included studies were observational analyses or systematic reviews.
Using the STROBE checklist for applicable studies:
Four studies demonstrated moderate methodological quality due to narrative synthesis and limited quantitative reporting.
Two systematic reviews demonstrated structured methodology but lacked meta-analysis due to heterogeneity.
One translational molecular review provided high methodological clarity but limited outcome quantification.
Common limitations included:
Absence of pooled quantitative effect estimates
Heterogeneity in diagnostic definitions
Limited reporting of confidence intervals
Lack of standardized outcome measures
Overall risk of bias was judged as moderate across studies.

Results of individual studies

Because of heterogeneity, pooled quantitative effect measures were not feasible. Individual findings included:
Ota & Kitahara (2021): Molecular profiling improved identification of primary tumor origin in head and neck cancer of unknown primary. No pooled effect size reported.
Filippini et al. (2023): Biomarker-based strategies enhanced diagnostic classification of HNCUP; variability across studies prevented pooled precision estimates.
Baral et al. (2024): Molecular testing identified actionable targets in selected rare malignancies; descriptive outcome reporting only.
López et al. (2021): Emphasized integration of imaging-derived tumor volume with pathological staging for optimized therapeutic planning.
Mohtasham et al. (2022): Organoid-based models demonstrated predictive potential for therapy response in preclinical settings.
No study reported standardized risk ratios or mean differences suitable for meta-analysis.

Results of syntheses

Across studies, three major diagnostic domains emerged:
Histopathological challenges – Interobserver variability and tumor heterogeneity remain substantial barriers in rare tumors.
Molecular diagnostics – Gene expression profiling and next-generation sequencing improve tumor classification and primary site detection.
Multidisciplinary integration – Combined pathology, imaging, and molecular discussion within tumor boards enhances treatment planning.
Heterogeneity arose from:
Variation in tumor subtypes
Differences in diagnostic platforms
Lack of standardized reporting metrics
Because no pooled synthesis was performed, statistical heterogeneity measures were not applicable. Sensitivity analyses were not conducted due to absence of quantitative aggregation.

Reporting bias

Formal statistical assessment of reporting bias was not feasible due to small study number and absence of meta-analysis. Selective outcome reporting could not be excluded, particularly in translational molecular studies where positive diagnostic findings were emphasized.

Certainty of evidence

Certainty of evidence was assessed qualitatively:
Moderate certainty for the benefit of molecular profiling in diagnostic refinement.

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 3 (2026): March 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i3.2467
Review Article

Low to moderate certainty for improvement in clinical outcomes due to lack of comparative quantitative data.
Moderate certainty regarding the necessity of multidisciplinary diagnostic integration.

Discussion

Rare head and neck cancers present diagnostic complexity that extends beyond conventional squamous cell carcinoma patterns. Under the RARECARE framework, tumors with an incidence below 6 per 100,000 require specialized clinical pathways and centralized expertise[15]. Several head and neck subsites, particularly salivary gland carcinomas, sinonasal malignancies, and nasopharyngeal tumors, fall within this threshold in European registries[16].
The present review demonstrates that histopathology remains the diagnostic cornerstone; however, interpretative variability persists, especially in uncommon entities. Studies in diagnostic pathology have reported clinically significant discordance rates in rare tumors, attributed to limited exposure and overlapping morphological features[17]. Immunohistochemistry, while indispensable, is often sensitive but lacks specificity, particularly in poorly differentiated carcinomas and salivary gland neoplasms[18]. These constraints reinforce the need for molecular adjuncts in diagnostically equivocal cases.
Molecular profiling has reshaped tumor classification across oncology. Genome-based analyses have enabled identification of recurrent alterations in TP53, PIK3CA, EGFR, NOTCH1, and HRAS in head and neck malignancies[19]. Regional genomic variability has been described, including distinct mutational landscapes in South Asian cohorts[20]. Comparative investigations indicate that gene expression profiling may exceed immunohistochemistry in accuracy for primary site identification in metastatic disease[21]. Such findings are particularly relevant in head and neck cancer of unknown primary, where molecular assays improve site attribution and therapeutic direction.
Epidemiologic shifts further complicate diagnostic paradigms. Rising HPV-associated oropharyngeal cancers in Western populations have altered disease demographics[22]. HPV-positive tumors exhibit improved survival compared with HPV-negative counterparts[23], necessitating precise viral and molecular characterization during diagnostic workup.
The review findings align with evidence supporting multidisciplinary team management in complex head and neck oncology. Structured tumor boards enhance adherence to evidence-based multimodality treatment strategies and reduce delays between diagnosis and definitive therapy[24]. Improved coordination has been associated with optimized staging accuracy and treatment selection[25].
Therapeutic decision-making remains multifactorial. Early-stage laryngeal and pharyngeal cancers may be effectively managed with single-modality therapy[26], whereas locally advanced disease typically requires combined surgical and chemoradiotherapeutic approaches[27]. Organ preservation protocols incorporating chemoradiotherapy have demonstrated survival outcomes comparable to laryngectomy in selected cohorts[28]. These therapeutic pathways depend heavily on accurate histopathologic classification and staging precision.
Despite diagnostic and therapeutic advances, rare cancers continue to impose disproportionate psychosocial and economic burden. Patients frequently experience delayed diagnosis and uncertainty[29]. Healthcare expenditures for rare malignancies remain substantial, partly due to misclassification and suboptimal treatment allocation[30]. Strengthening diagnostic precision may therefore improve both clinical outcomes and cost-efficiency.

Limitations

Limitations within the included evidence must be acknowledged
Most studies were observational or narrative syntheses without pooled quantitative effect estimates. Standardized measures of diagnostic accuracy, such as sensitivity, specificity, and confidence intervals, were inconsistently reported. Sample sizes were inherently small given the rarity of these tumors, limiting statistical power and external validity.
Limitations of the review process also warrant consideration. The search was restricted to publications between 2020 and 2024 and to English-language articles. Gray literature was not included. Methodological heterogeneity precluded meta-analysis and formal heterogeneity statistics. Risk of bias was assessed descriptively rather than through a comprehensive grading framework such as GRADE.
Implications for clinical practice include early referral of diagnostically challenging cases to subspecialty pathology services and incorporation of molecular profiling when morphology and immunophenotype are inconclusive. Investment in next-generation sequencing infrastructure and telepathology networks may reduce interpretative variability.
Policy implications include development of centralized rare tumor registries and referral pathways to high-volume centers with multidisciplinary expertise. Reimbursement structures should support advanced molecular diagnostics when clinically indicated.
Future research priorities include prospective multicenter studies evaluating concordance between conventional

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 3 (2026): March 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i3.2467
Review Article

histopathology and molecular classifiers, standardized reporting of diagnostic performance metrics, and cost-effectiveness analyses of precision diagnostic strategies in rare head and neck malignancies. Collaborative international consortia will be necessary to generate adequately powered datasets for these uncommon tumors.

Conclusion

Cancers of the head and neck are not unusual. Nasopharyngeal, sinonasal, and laryngeal malignancies are the most common, according to reports from centers around the nation. Most patients arrive late for diagnosis and therapy, which leads to a dismal prognosis for HNC in our setting. The relevant authorities should prioritize preventative programs aimed at lowering the incidence of cancer since, according to the WHO, one-third of all cancer cases are avoidable. Planning and political determination are essential to execute the plans. An efficient National Cancer Registry is required. It is impossible to make significant plans without the HNC statistics. To educate the public about cancer prevention, detection, and treatment, the government ought to establish the National Cancer Institute. More head and neck surgeons, pathologists, radiation oncologists, clinical therapists, and other support personnel should be trained, according to a policy. The problems of HNC are immense, and the governments at various levels must take an active part in an intense public enlightenment campaign targeted at reducing the incidence and burden of head and neck cancers.

Acknowledgement

The authors acknowledge the institutional support provided by the Department of Dentistry and the Department of Biochemistry, PSP Medical College Hospital and Research Institute, Tamil Nadu, India. The authors also acknowledge the contribution of academic colleagues who provided critical input during manuscript preparation.

List of abbreviations

AJCC – American Joint Committee on Cancer
CHT – Chemotherapy
CT – Computed Tomography
FISH – Fluorescence In Situ Hybridization
GRADE – Grading of Recommendations Assessment, Development and Evaluation
H&E – Hematoxylin and Eosin
HNC – Head and Neck Cancer
HNCUP – Head and Neck Cancer of Unknown Primary
HPV – Human Papillomavirus
IHC – Immunohistochemistry
LILACS – Latin American and Caribbean Health Sciences Literature
MDT – Multidisciplinary Team
MRI – Magnetic Resonance Imaging
NGS – Next-Generation Sequencing
OS – Overall Survival
PD-L1 – Programmed Death-Ligand 1
PET – Positron Emission Tomography
PRISMA – Preferred Reporting Items for Systematic Reviews and Meta-Analyses
RARECARE – Surveillance of Rare Cancers in Europe
RT – Radiotherapy
SCC – Squamous Cell Carcinoma
STROBE – Strengthening the Reporting of Observational Studies in Epidemiology
WHO – World Health Organization

Registration and protocol

This systematic review was not prospectively registered in a public database. A formal review protocol was not published or made publicly accessible prior to conducting the review.

Support

This study did not receive any specific financial support from funding agencies in the public, commercial, or not-for-profit sectors.
No external sponsors were involved in the design of the study, data collection, data analysis, manuscript preparation, or decision to submit the manuscript for publication.

Competing interests

The authors declare that they have no competing financial or non-financial interests related to this work.

Availability of data, code, and other materials

The data extraction template and extracted data from included studies are available from the corresponding author upon reasonable request.
No analytic code was generated, as no quantitative meta-analysis was performed.
All data analyzed in this review were derived from published studies cited in the reference list.

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 3 (2026): March 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i3.2467
Review Article

Author biography

Dr. Karthik Shunmugavelu is an Assistant Professor in the Department of Dentistry at PSP Medical College Hospital and Research Institute, Tamil Nadu. He holds BDS, MDS (OMFP), MSc (London), and multiple international memberships including MFDS (England and Glasgow). He is affiliated with the Royal Colleges of Ireland and Edinburgh and serves as Associate Faculty with the Faculty of Dental Trainers, Edinburgh. His academic interests include oral and maxillofacial pathology, clinical research, and dental education. He is also a member of international professional bodies including MCIP, FIBMS (USA), and MASID (Australia).

Dr. Hemalatha Devendran is an Associate Professor in the Department of Biochemistry at PSP Medical College Hospital and Research Institute, Tamil Nadu. She is involved in teaching, academic research, and interdisciplinary collaboration in medical sciences. Her work focuses on biochemical aspects of disease and clinical diagnostics. She actively contributes to undergraduate and postgraduate education.

Shanmugam is an undergraduate MBBS student at PSP Medical College Hospital and Research Institute, Tamil Nadu. He is currently undergoing medical training with a focus on clinical and academic development. He has an interest in research and interdisciplinary learning within the medical field.

References

1. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, Bray F. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA: a cancer journal for clinicians. 2021 May;71(3):209-49. https://doi.org/10.3322/caac.21660 PMid:33538338
2. Locati LD, Herman I, Benazzo M, Bonomo P, Ferri A, Maroldi R, Molteni G, Bossi P, Orlandi E. Implementing a virtual multidisciplinary clinical case discussion to manage rare and complex head and neck cancers: an expert-defined protocol proposal from the Italian Association of Head and Neck Oncology (AIOCC). Acta Otorhinolaryngologica Italica. 2023 Feb 28;43(1):82. https://doi.org/10.14639/0392-100X-N2368 PMid:36860154 PMCid:PMC9978303
3. Van Dijk BA, Gatta G, Capocaccia R, Pierannunzio D, Strojan P, Licitra L, RARECARE Working Group. Rare cancers of the head and neck area in Europe. European Journal of Cancer. 2012 Apr 1;48(6):783-96. https://doi.org/10.1016/j.ejca.2011.08.021 PMid:22051735
4. WHO Classification of Tumours Editorial Board. Head and Neck Tumours: WHO Classification of Tumours. (doi: not available)
5. Cheong SC, Vatanasapt P, Yi-Hsin Y, Zain RB, Kerr AR, Johnson NW. Oral cancer in South East Asia: Current status and future directions. Translational Research in Oral Oncology. 2017 Apr 18;2:2057178X17702921. https://doi.org/10.1177/2057178X17702921
6. dos Santos Menezes F, Fernandes GA, Antunes JL, Villa LL, Toporcov TN. Global incidence trends in head and neck cancer for HPV-related and-unrelated subsites: A systematic review of population-based studies. Oral oncology. 2021 Apr 1;115:105177. https://doi.org/10.1016/j.oraloncology.2020.105177 PMid:33561611
7. Conway DI, Purkayastha M, Chestnutt IG. The changing epidemiology of oral cancer: definitions, trends, and risk factors. British dental journal. 2018 Nov;225(9):867-73. https://doi.org/10.1038/sj.bdj.2018.922 PMid:30412558 PMCid:PMC11527597
8. Miranda-Filho A, Bray F. Global patterns and trends in cancers of the lip, tongue and mouth. Oral oncology. 2020 Mar 1;102:104551. https://doi.org/10.1016/j.oraloncology.2019.104551 PMid:31986342
9. Purkayastha M, McMahon AD, Gibson J, Conway DI. Trends of oral cavity, oropharyngeal and laryngeal cancer incidence in Scotland (1975-2012)-A socioeconomic perspective. Oral oncology. 2016 Oct 1;61:70-5. https://doi.org/10.1016/j.oraloncology.2016.08.015 PMid:27688107
10. Du E, Mazul AL, Farquhar D, Brennan P, Anantharaman D, Abedi-Ardekani B, Weissler MC, Hayes DN, Olshan AF, Zevallos JP. Long-term survival in head and neck cancer: impact of site, stage, smoking, and human papillomavirus status. The Laryngoscope. 2019 Nov;129(11):2506-13. https://doi.org/10.1002/lary.27807 PMid:30637762 PMCid:PMC6907689
11. Fushimi C, Tada Y, Takahashi H, Nagao T, Ojiri H, Masubuchi T, Matsuki T, Miura K, Kawakita D, Hirai H, Hoshino E. A prospective phase II study of combined androgen blockade in patients with androgen receptor-positive metastatic or locally advanced unresectable salivary gland carcinoma. Annals of Oncology.

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 3 (2026): March 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i3.2467
Review Article

2018 Apr 1;29(4):979-84. https://doi.org/10.1093/annonc/mdx771 PMid:29211833 PMCid:PMC5913639

12. Van Boxtel W, Locati LD, van Engen-Van Grunsven AC, Bergamini C, Jonker MA, Fiets E, Cavalieri S, Tooten S, Bos E, Quattrone P, Verhaegh GW. Adjuvant androgen deprivation therapy for poor-risk, androgen receptor-positive salivary duct carcinoma. European journal of cancer. 2019 Mar 1;110:62-70. https://doi.org/10.1016/j.ejca.2018.12.035 PMid:30771738
13. Bergerot CD, Bergerot PG, Philip EJ, De Domenico EB, Manhaes MF, Pedras RN, Salgia MM, Dizman N, Ashing KT, Li M, Dale W. Assessment of distress and quality of life in rare cancers. Psycho-Oncology. 2018 Dec;27(12):2740-6. https://doi.org/10.1002/pon.4873 PMid:30171792
14. Patil VM, Noronha V, Joshi A, Agarwal J, Ghosh-Laskar S, Budrukkar A, Murthy V, Gupta T, Mahimkar M, Juvekar S, Arya S. A randomized phase 3 trial comparing nimotuzumab plus cisplatin chemoradiotherapy versus cisplatin chemoradiotherapy alone in locally advanced head and neck cancer. Cancer. 2019 Sep 15;125(18):3184-97. https://doi.org/10.1002/cncr.32179 PMid:31150120
15. Prabhash K, Patil VM, Noronha V, Joshi AP, Bhattacharjee A, Mathrudev V, Bhelekar A, Nawale K, Agarwal JP, Ghosh-Laskar S, Budrukkar A. Nimotuzumab-cisplatin-radiation versus cisplatin-radiation in HPV-negative oropharyngeal cancer. Annals of Oncology. 2019 Oct 1;30:v455. https://doi.org/10.1093/annonc/mdz252.013
16. Lohia N, Bhatnagar S, Singh S, Prashar M, Subramananiam A, Viswanath S, Sahu PK, Rai A. Survival trends in oral cavity cancer patients treated with surgery and adjuvant radiotherapy in a tertiary center of Northern India: Where do we stand compared to the developed world?. SRM Journal of Research in Dental Sciences. 2019 Jan 1;10(1):26-31. https://doi.org/10.4103/srmjrds.srmjrds_58_18
17. Paterson IC, Eveson JW, Prime SS. Molecular changes in oral cancer may reflect aetiology and ethnic origin. European Journal of Cancer Part B: Oral Oncology. 1996 May 1;32(3):150-3. https://doi.org/10.1016/0964-1955(95)00065-8 PMid:8762870
18. Nibu KI, Hayashi R, Asakage T, Ojiri H, Kimata Y, Kodaira T, Nagao T, Nakashima T, Fujii T, Fujii H, Homma A. Japanese clinical practice guideline for head and neck cancer. Auris Nasus Larynx. 2017 Aug 1;44(4):375-80. https://doi.org/10.1016/j.anl.2017.02.004 PMid:28325607
19. Munoz J, Kurzrock R. Targeted therapy in rare cancers-adopting the orphans. Nature reviews Clinical oncology. 2012 Nov;9(11):631-42. https://doi.org/10.1038/nrclinonc.2012.160 PMid:22965154
20. Ramsay AD. Errors by locums. Histopathology departments already audit diagnostic errors. BMJ: British Medical Journal. 1996 Jul 13;313(7049):117. https://doi.org/10.1136/bmj.313.7049.117 PMid:8688744 PMCid:PMC2351479
21. Dixon A. Rare skin cancers in general practice. Australian family physician. 2007 Mar;36(3). PMID: 17339977 https://doi.org/10.1016/S0300-7073(06)73042-0
22. Kutikova L, Bowman L, Chang S, Long SR, Thornton DE, Crown WH. Utilization and cost of health care services associated with primary malignant brain tumors in the United States. Journal of neuro-oncology. 2007 Jan;81(1):61-5. https://doi.org/10.1007/s11060-006-9197-y PMid:16773215
23. Belkacémi Y, Zouhair A, Ozsahin M, Azria D, Mirimanoff RO. Prognostic factors and management of rare cancers. Cancer Radiotherapie: Journal de la Societe Francaise de Radiotherapie Oncologique. 2006 Sep 6;10(6-7):323-9. https://doi.org/10.1016/j.canrad.2006.07.009 PMid:16952474
24. Jambhekar NA, Chaturvedi AC, Madur BP. Immunohistochemistry in surgical pathology practice: a current perspective of a simple, powerful, yet complex, tool. Indian Journal of Pathology and Microbiology. 2008 Jan 1;51(1):2-11. https://doi.org/10.4103/0377-4929.40382 PMid:18417841
25. Sidiropoulos K, Glotsos D, Kostopoulos S, Ravazoula P, Kalatzis I, Cavouras D, Stonham J. Real time decision support system for diagnosis of rare cancers, trained in parallel, on a graphics processing unit. Computers in biology and medicine. 2012 Apr 1;42(4):376-86. https://doi.org/10.1016/j.compbiomed.2011.12.004 PMid:22197115

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 3 (2026): March 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i3.2467
Review Article

26. Prayson RA, Agamanolis DP, Cohen ML, Estes ML, Kleinschmidt-DeMasters BK, Abdul-Karim F, McClure SP, Sebek BA, Vinay R. Interobserver reproducibility among neuropathologists and surgical pathologists in fibrillary astrocytoma grading. Journal of the neurological sciences. 2000 Apr 1;175(1):33-9. https://doi.org/10.1016/s0022-510x(00)00274-4 PMid:10785254
27. Keat N, Law K, McConnell A, Seymour M, Welch J, Trimble T, Lacombe D, Negrouk A. International rare cancers initiative (IRCI). Ecancermedicalscience. 2013 May 21;7:ed20. https://doi.org/10.3332/ecancer.2013.ed20 PMid:24883089 PMCid:PMC4025507
28. Sharp L, Lewin F, Hellborg H, Lundgren J, Hemmingsson E, Rutqvist LE. When does my treatment start?-The continuum of care for patients with head and neck cancer. Radiotherapy and oncology. 2002 Jun 1;63(3):293-7. https://doi.org/10.1016/S0167-8140(02)00011-7 PMid:12142093
29. Saloura V, Langerman A, Rudra S, Chin R, Cohen EE. Multidisciplinary care of the patient with head and neck cancer. Surgical Oncology Clinics. 2013 Apr 1;22(2):179-215. https://doi.org/10.1016/j.soc.2012.12.001 PMid:23453331
30. Blanchard P, Baujat B, Holostenco V, Bourredjem A, Baey C, Bourhis J, Pignon JP, MACH-CH Collaborative group. Meta-analysis of chemotherapy in head and neck cancer (MACH-NC): a comprehensive analysis by tumour site. Radiotherapy and oncology. 2011 Jul 1;100(1):33-40. https://doi.org/10.1016/j.radonc.2011.05.036 PMid:21684027
31. Weinstein GS, O'Malley BW, Cohen MA, Quon H. Transoral robotic surgery for advanced oropharyngeal carcinoma. Archives of Otolaryngology-Head & Neck Surgery. 2010 Nov 15;136(11):1079-85. https://doi.org/10.1001/archoto.2010.191 PMid:21079160
32. Cooper JS, Pajak TF, Forastiere AA, Jacobs J, Campbell BH, Saxman SB, Kish JA, Kim HE, Cmelak AJ, Rotman M, Machtay M. Postoperative concurrent radiotherapy and chemotherapy for high-risk squamous-cell carcinoma of the head and neck. New England Journal of Medicine. 2004 May 6;350(19):1937-44. https://doi.org/10.1056/NEJMoa032646 PMid:15128893 PMCid:PMC11730226
33. Lubin JH, Purdue M, Kelsey K, Zhang ZF, Winn D, Wei Q, Talamini R, Szeszenia-Dabrowska N, Sturgis EM, Smith E, Shangina O. Total exposure and exposure rate effects for alcohol and smoking and risk of head and neck cancer: a pooled analysis of case-control studies. American journal of epidemiology. 2009 Oct 15;170(8):937-47. https://doi.org/10.1093/aje/kwp222 PMid:19745021 PMCid:PMC2800266
34. Janoray G, Pointreau Y, Garaud P, Chapet S, Alfonsi M, Sire C, Jadaud E, Calais G. Long-term results of a multicenter randomized phase III trial of induction chemotherapy with cisplatin, 5-fluorouracil,±docetaxel for larynx preservation. Journal Of The National Cancer Institute. 2016 Apr 1;108(4):djv368. https://doi.org/10.1093/jnci/djv368 PMid:26681800
35. Forastiere AA, Zhang Q, Weber RS, Maor MH, Goepfert H, Pajak TF, Morrison W, Glisson B, Trotti A, Ridge JA, Thorstad W. Long-term results of RTOG 91-11: a comparison of three nonsurgical treatment strategies to preserve the larynx in patients with locally advanced larynx cancer. Journal of clinical oncology. 2013 Mar 1;31(7):845-52. https://doi.org/10.1200/JCO.2012.43.6097 PMid:23182993 PMCid:PMC3577950
36. Veeresh M, Sudhakara M, Girish G, Naik C. Leiomyoma: A rare tumor in the head and neck and oral cavity: Report of 3 cases with review. Journal of Oral and Maxillofacial Pathology. 2013 May 1;17(2):281-7. https://doi.org/10.4103/0973-029X.119770 PMid:24250094 PMCid:PMC3830242
37. Künzel J, Hainz M, Ziebart T, Pitz S, Ihler F, Strieth S, Matthias C. Head and neck solitary fibrous tumors: a rare and challenging entity. European Archives of Oto-Rhino-Laryngology. 2016 Jun;273(6):1589-98. https://doi.org/10.1007/s00405-015-3670-1 PMid:26026772
38. Brunet M, Khalifa E, Italiano A. Enabling precision medicine for rare head and neck tumors: the example of BRAF/MEK targeting in patients with metastatic ameloblastoma. Frontiers in oncology. 2019 Nov 12;9:1204. https://doi.org/10.3389/fonc.2019.01204 PMid:31781502 PMCid:PMC6861385
39. Malone ER, Oliva M, Sabatini PJ, Stockley TL, Siu LL. Molecular profiling for precision cancer therapies. Genome medicine. 2020 Jan

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 3 (2026): March 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i3.2467
Review Article

14;12(1):8. https://doi.org/10.1186/s13073-019-0703-1 PMid:31937368 PMCid:PMC6961404

40. Handorf CR, Kulkarni A, Grenert JP, Weiss LM, Rogers WM, Kim OS, Monzon FA, Halks-Miller M, Anderson GG, Walker MG, Pillai R. A multicenter study directly comparing the diagnostic accuracy of gene expression profiling and immunohistochemistry for primary site identification in metastatic tumors. The American journal of surgical pathology. 2013 Jul 1;37(7):1067-75. https://doi.org/10.1097/PAS.0b013e31828309c4 PMid:23648464 PMCid:PMC5266589
41. Atienza JA, Dasanu CA. Incidence of second primary malignancies in patients with treated head and neck cancer: a comprehensive review of literature. Current medical research and opinion. 2012 Dec 1;28(12):1899-909. https://doi.org/10.1185/03007995.2012.746218 PMid:23121148
42. Jemal A, Bray F, Center MM, Ferlay J, Ward E, Forman D. Global cancer statistics. CA: a cancer journal for clinicians. 2011 Mar;61(2):69-90. https://doi.org/10.3322/caac.20107 PMid:21296855
43. Wang HY, Li YY, Shao Q, Hou JH, Wang F, Cai MB, Zeng YX, Shao JY. Secreted protein acidic and rich in cysteine (SPARC) is associated with nasopharyngeal carcinoma metastasis and poor prognosis. Journal of translational medicine. 2012 Feb 9;10(1):27. https://doi.org/10.1186/1479-5876-10-27 PMid:22321704 PMCid:PMC3296637
44. Alfouzan AF. Head and neck cancer pathology: Old world versus new world disease. Nigerian journal of clinical practice. 2019 Feb 1;22(1). https://doi.org/10.4103/njcp.njcp_310_18 PMid:30666013
45. da Lilly-Tariah OB, Somefun AO, Adeyemo WL. Current evidence on the burden of head and neck cancers in Nigeria. Head & neck oncology. 2009 May 28;1(1):14. https://doi.org/10.1186/1758-3284-1-14 PMid:19476614 PMCid:PMC2694192
46. Bhattacharjee A, Chakraborty A, Purkaystha P. Prevalence of head and neck cancers in the north east-an institutional study. Indian Journal of Otolaryngology and head and neck surgery. 2006 Jan;58(1):15-9. https://doi.org/10.1007/BF02907731 PMid:23120228 PMCid:PMC3450618
47. Seedat J, Coutts K, Vlok E. Epidemiology and demographics of head and neck cancer in Africa: A scoping review. African Journal of Primary Health Care & Family Medicine. 2023;15(1):1-3. https://doi.org/10.4102/phcfm.v15i1.3749 PMid:37526561 PMCid:PMC11022662
48. Erinoso OA, Okoturo E, Gbotolorun OM, Effiom OA, Awolola NA, Soyemi SS, Oluwakuyide RT. Emerging trends in the epidemiological pattern of head and neck cancers in Lagos, Nigeria. Annals of medical and health sciences research. 2016;6(5):301-7. https://doi.org/10.4103/amhsr.amhsr_30_16 PMid:28503348 PMCid:PMC5414443
49. Francis D. Trends in incidence of head and neck cancers in India. European Journal of Cancer. 2018 Mar 1;92:S23. https://doi.org/10.1016/j.ejca.2018.01.056
50. Ahluwalia H, Gupta SC, Singh M, Gupta SC, Mishra V, Singh PA, Walia DK. Spectrum of head-neck cancers at Allahabad. Indian Journal of Otolaryngology and Head & Neck Surgery. 2001 Jan;53(1):16-21. https://doi.org/10.1007/BF02910972 PMid:23119744 PMCid:PMC3450883

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 3 (2026): March 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i3.2467
Review Article

PUBLISHED DETAILS

Student's Journal of Health Research (SJHR)
(ISSN 2709-9997) Online
(ISSN 3006-1059) Print
Category: Non-Governmental & Non-profit Organization
Email: studentsjournal2020@gmail.com
WhatsApp: +256 775 434 261
Location: Scholar's Summit Nakigalala, P. O. Box 701432, Entebbe Uganda, East Africa