

Malignant Head and Neck Tumors in Basrah: A Clinicopathological Study

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<https://dx.doi.org/10.13005/bpj/2376>

(Received: 14 October 2021; accepted: 04 February 2022)

Malignant tumors of the head and neck exhibit a wide range of histological characteristics and involve multiple locations, therefore considered as a diverse collection of site-specific malignancies. The aim of the study was to evaluate key clinicopathological characteristics of head and neck malignancies in Basrah. In this retrospective study, the histopathological reports of 564 cases with head and neck malignancies were diagnosed in Basrah from 2012 to 2017. All of the cases were analyzed according to the patient's age and gender, as well as the location and histological type of the tumor. The patients' mean age of presentation was 46.45 ± 20.75 SD, with about two third of the cases at or over 40 years of age and about 53.19% of cases were males. About 11.52% of the patients were in the age of children and adolescents. Head and neck lymph nodes were the most frequent site (30.67%) involved by malignant tumors, followed by the thyroid gland (20.21%), skin and soft tissues (12.77%), larynx (10.82%) and oral cavity (7.8%), respectively, and the most frequent type of malignancy was squamous cell carcinoma. Hence, the study revealed that head and neck malignancies in Basrah are mainly a disease of elderly, with slight male predominance. Head and neck lymph nodes, followed by thyroid gland, skin and soft tissue, larynx and oral cavity, were the commonest sites, respectively, and squamous cell carcinoma was the most frequent malignant tumor.

Keywords: Basrah; Clinicopathological; Head and neck; Malignancies;
Male Predominance; Squamous cell carcinoma.

Malignancies of the head and neck form a diverse category of site specific tumors that frequently have an aggressive behavior^{1,2}. Such malignant tumors were considered as the sixth most common malignancy around the world with more than 550,000 cases diagnosed each year and approximately 300,000 deaths^{3,4}. The region of the head and neck is complex and malignancies arising

from this region can be classified into several anatomical sites: malignancies arising from the nasal cavity and paranasal sinuses, nasopharynx, hypopharynx, larynx, oral cavity, oropharynx, ear, salivary glands, thyroid gland, head and neck lymph nodes, odontogenic tumors, craniofacial bones, skin, soft tissues and paraganglionic system^{2,5,6}. Squamous cell carcinomas arising from the mucosa

of the upper aerodigestive tract account for the vast majority of head and neck malignancies^{1,7,8}. However, other types of malignancies of epithelial origin, as well as mesenchymal, lymphoid, endocrine, neural and other cellular backgrounds, do exist⁹. Most head and neck malignancies, particularly squamous cell carcinoma, are linked to tobacco and alcohol intake¹⁰. Furthermore, poor oral sanitation and infection with human papillomavirus are recognizable risk factors for tongue, tonsils and oropharyngeal malignancies^{11,12,13}. The risk of head and neck malignancies increases with age, and literature review revealed that the mean age of presentation was mainly in the 5th-6th decade for the Asian population, while the 7th-8th decade was the mean age of presentation for the North American population¹⁴. In addition to age influence, studies show that gender also may play a role and noticed that such malignancies were more in males than females, in general^{14,15}.

Oral and pharyngeal cancers have a significant impact on worldwide affliction of malignancies that is primarily owed to the extensive usage of cigarettes and alcohol and in fact are regarded as the sixth most prevalent cancer worldwide¹⁶. Generally speaking, oral cavity squamous cell carcinoma represents the largest group of head and neck malignancies¹⁷.

Literature review displays little information concerning head and neck malignancies in Basrah, and most studies were concerned with malignancies of certain sites, mainly the oral cavity. Thus, this study was conducted to explore some epidemiological features of head and neck malignancies in Basrah including most of head and neck regions (even the thyroid gland, bones, skin, soft tissue and head and neck lymph nodes were included) with a focus on certain clinico-pathological features. Such observations are mandatory to assist global tactics for cancer control.

MATERIALS AND METHOD

Our data were collected from the histopathological reports of 564 cases with head and neck malignancies diagnosed in Al-Haroon private pathological lab in Basrah from 2012 to 2017 and were retrospectively evaluated. These reports contained information on the morphology

and location of the malignant tumors in addition to name, age, gender and complaint of each patient. The study adopted the following exclusion criteria: reports with non-conclusive diagnosis, fine needle aspirate cytology, benign tumors, esophageal malignancies, central nervous system and eye tumors. All of the cases were analyzed according to the patient's age and gender, as well as the location and histological type of the tumor. The malignant tumors were classified from anatomical point of view as follow: Larynx, oral cavity, oropharynx, nasopharynx, hypopharynx, ear, sinonasal, head and neck lymph nodes, salivary glands and thyroid gland in addition to skin, soft tissue and bone malignant tumors. Data were analyzed by means of SPSS software (Version 24) using the chi-square test. Statistical significance was defined as a P-value of less than 0.05.

RESULTS

A total of 564 specimens of head and neck malignant tumors were submitted to histopathological examination in Al-Haroon private pathological lab in Basrah from 2012 to 2017. The age of the patients ranged from 4 months to 90 years old, with the youngest being the 4-months old infant with neck fibrosarcoma and the oldest were two 90 years old patients, one suffering from Non-Hodgkin lymphoma of a cervical lymph node while the other had oral squamous cell carcinoma. The mean age of patients' presentation was 46.45 ± 20.75 SD, with about two third of the patients at or above 40 years of age and the range (51-60) years being the most frequent age of presentation, which was closely tailed by (61-70) years, as shown in table 1, whereas 11.52% of patients were children and adolescent.

Approximately 46.81% of patients were females and 53.19% were males, as in table 1, having a male to female ratio of (1:0.88). Most patients had carcinomas (69.33%), followed by lymphomas (26.06%), then sarcomas (3.37%), respectively, as in table 1, the term (others) referred to cases of undifferentiated malignant tumors. Head and neck lymph nodes were the commonest site involved by malignant tumors (secondaries or lymphomas) (30.67%), followed by the thyroid gland (20.21%), skin and soft tissues (12.77%), larynx (10.82%) and oral cavity

Table 1. Patients distribution based on clinical-demographic criteria and tumors' type and site

Variables	Number of patients	Percent
Age group		
0-10	33	5.85
Nov-20	44	7.8
21-30	69	12.23
31-40	66	11.7
41-50	88	15.6
51-60	106	18.79
61-70	102	18.09
71-80	44	7.8
81-90	12	2.13
Gender		
Female	264	46.81
Male	300	53.19
Tumor type		
Carcinoma	391	69.33
Sarcoma	19	3.37
Lymphoma	147	26.06
Others	7	1.24
Tumor site		
Thyroid gland	114	20.21
Head and neck lymph nodes	173	30.67
Larynx	61	10.82
Oral cavity	44	7.8
Oropharynx	12	2.13
Nasopharynx	33	5.85
Hypopharynx	8	1.42
Sinonasal	11	1.95
Salivary glands	14	2.48
Ear	4	0.71
Skin and soft tissue	72	12.77
Bone	18	3.19

(7.8%), respectively (the top five malignancies in descending order), as in table 1. After excluding lymph nodes, skin and soft tissue malignancies, the oral cavity was the commonest site regarding malignant head tumors (with the tongue being the commonest location), while the region of the ear was the least affected site (0.71%), as in table 1.

In males, the (51-60) years age group was the most frequent age of presentation, closely followed by (61-70) years, while females were mostly presented in the age group of (61-70) years, closely tailed by (41-50) years, as shown in table 2, the relation between age distribution and gender was statistically not significant.

The evaluation of the relation between the histological type and site of the malignant tumor revealed that carcinoma was the predominant malignancy of all sites excluding the head and neck lymph nodes and oropharynx, where lymphoma was the predominant type, as displayed in table 3. The relation was statistically significant.

Histological evaluation of the malignant tumors revealed that squamous cell carcinoma was the most frequent type (26.42%), followed by papillary carcinoma (17.38%), Hodgkin lymphoma (14.54%), Non-Hodgkin lymphoma (11.52%) and basal cell carcinoma (8.87%), that were the top five histological subtypes, respectively, as shown in Figure 1. The study also revealed that papillary carcinoma was the commonest malignancy of the thyroid gland, lymphoma (mainly Hodgkin lymphoma) was the commonest malignancy in head and neck lymph nodes, squamous cell carcinoma was nearly the only type of malignancy

Table 2. Age distribution of malignant tumors in relation to gender

Range of age	Gender distribution			
	Males		Females	
	Number	Percent	Number	Percent
0-10	15	5	18	6.82
Nov-20	24	8	20	7.58
21-30	33	11	36	13.64
31-40	32	10.67	34	12.88
41-50	44	14.67	44	16.67
51-60	64	21.33	42	15.91
61-70	54	18	48	18.18
71-80	28	9.33	16	6.06
81-90	6	2	6	2.27
Total	300	100%	264	100%

Table 3. Site distribution of malignant tumors in relation to tumor's type

Site	Carcinoma		Type of malignant tumor				Others		Total
	Number	Percent	Sarcoma	Lymphoma	Sarcoma	Lymphoma	Number	Percent	
Thyroid gland	113	99.12	1	0	0.88	0	0	0	114
Head and neck lymph nodes	45	26.01	0	126	0	72.83	2	1.16	173
Larynx	61	100	0	0	0	0	0	0	61
Oral cavity	43	97.73	1	0	2.27	0	0	0	44
Oropharynx	2	16.67	0	10	0	83.33	0	0	12
Nasopharynx	29	87.88	0	4	0	12.12	0	0	33
Hypopharynx	8	100	0	0	0	0	0	0	8
Sinonasal	5	45.45	3	2	27.27	18.18	1	9.09	11
Salivary glands	9	64.29	0	2	0	14.29	3	21.43	14
Ear	3	75	1	0	25	0	0	0	4
Skin and soft tissue	63	87.5	8	1	11.11	1.39	0	0	72
Bone	10	55.56	5	2	27.78	11.11	1	5.56	18

found in the larynx and hypopharynx, and was the commonest malignancy in the oral cavity and ear, meanwhile, Non-Hodgkin lymphoma in oropharynx, nasopharyngeal carcinoma in nasopharynx, embryonic rhabdomyosarcoma in sinonasal region, mucoepidermoid carcinoma in the salivary glands, basal cell carcinoma in skin and soft tissue and secondary squamous cell carcinoma in bone, where the most frequent malignancies in these sites, as shown in table 4.

The study also revealed that carcinomas were more common in patients with the age within (51-70) years, sarcomas were more common within (0-10) years, while lymphomas were more

in the ages among (11-30) years, as in table 5, and the relation between age distribution and type of malignant tumor was statistically significant. It is also worth mentioning that about 66.15% of children and adolescents in the study had lymphoma.

Furthermore, lymphomas were more frequent in males, sarcomas were slightly more in males, while carcinomas were nearly equal in both genders, as in table 5, the relation between gender distribution and type of malignant tumor was statistically not significant. The study also displayed that all malignant tumors were more frequent above 40 years of age except head and

Table 4. The commonest malignant tumor according to tumor's site

Site	The most frequent malignant tumor	Number of cases	Percent	Other malignant tumors	Percent	Total number of cases
Thyroid gland	Papillary carcinoma	98	85.96	16	14.04	114
Head and neck lymph nodes	Hodgkin lymphoma	82	47.4	91	52.6	173
Larynx	Squamous cell carcinoma	60	98.36	1	1.64	61
Oral cavity	Squamous cell carcinoma	39	88.64	5	11.36	44
Oropharynx	Non Hodgkin lymphoma	10	83.33	2	16.67	12
Nasopharynx	Nasopharyngeal carcinoma	25	75.76	8	24.24	33
Hypopharynx	Squamous cell carcinoma	8	100	0	0	8
Sinonasal	Embryonic rhabdomyosarcoma	3	27.27	8	72.73	11
Salivary glands	Mucoepidermoid carcinoma	4	28.57	10	71.43	14
Ear	Squamous cell carcinoma	3	75	1	25	4
Skin and soft tissue	Basal cell carcinoma	50	69.44	22	30.56	72
Bone	Secondary squamous cell carcinoma	10	55.56	8	44.44	18

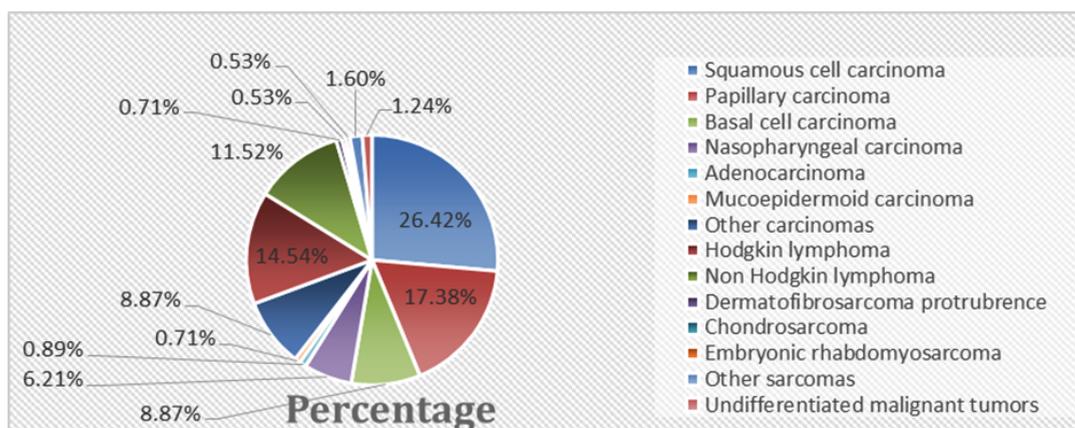


Fig. 1. The histological types of malignant tumors

neck lymph nodes and thyroid gland malignancies that were more frequently involved below the age of 40 years, as in table 6, the relation between tumor's site and age distribution was statistically significant. Moreover, all tumors were more frequent among females except for malignancies of the head and neck lymph nodes, larynx, oropharynx, nasopharynx and hypopharynx which were more frequent among males, as shown in table 7, in fact the thyroid gland was the commonest site involved in females, followed by head and neck lymph nodes, as compared to males where head and neck lymph nodes were the commonest site, followed by the larynx, the relation between tumor's site and gender distribution was statistically significant.

DISCUSSION

This retrospective study is the first study carried out to highlight the occurrence of head and neck malignant tumors in correlation to clinical-pathological criteria in Basrah. Malignancies of head and neck involve several histological types and sites, and in our study, the thyroid gland, head and neck lymph nodes, skin, soft tissue and bone were assessed, in addition to the traditional head and neck regions like larynx, oral cavity, oropharynx, hypopharynx, nasopharynx, salivary glands, ear and sinonasal regions. The study revealed that about two third of the cases were at

or above the age of 40 years at time of diagnosis in both males and females, in fact the most frequent age group was within the 6th decade closely followed by the 7th of life. Therefore malignant head and neck tumors were less common in young aged individuals less than 40 years of age, such results were consistent with the findings seen in other studies^{3,11,18,19,20,21,22,23,24}. The study also revealed that the most frequent age group among males was (51-60) years, as compared to females (61-70) years.

Males were slightly more affected than females presenting a male to female ratio of (1:0.88), which in a way resembles results of other studies where males were more affected than females but most studies had a higher male to female ratio^{3,5,11,12,14,15,20,23,24,25,26,27}. The male predominance could be attributed to some habits that have been regarded as risk factors for malignant tumors of head and neck like smoking and alcohol abuse that are strongly related to male gender and to some extent, may be attributed to the protective effect of estrogen exposure in females²⁸. However, a study performed by Hamideh Kadeh *et al.* showed a female predominance in head and neck malignancies¹⁹.

Most of the cases were carcinomas, followed by lymphomas while sarcomas represent only a small fraction of cases, suggesting that most risk factors are carcinogenic agents, which is in agreement with several studies worldwide^{15,19,23}.

Table 5. Age and gender distributions of patients according to the type of malignant tumor

Variable	Type of malignant tumor							
	Carcinoma		Sarcoma		Lymphoma		Others	
Range of age	Number	Percent	Number	Percent	Number	Percent	Number	Percent
0-10	2	0.51	6	31.58	21	14.29	4	57.14
11-20	13	3.32	2	10.53	29	19.73	0	0
21-30	41	10.49	1	5.26	27	18.37	0	0
31-40	48	12.28	1	5.26	16	10.88	1	14.29
41-50	67	17.14	3	15.79	17	11.56	1	14.29
51-60	88	22.51	3	15.79	14	9.52	1	14.29
61-70	86	21.99	2	10.53	14	9.52	0	0
71-80	36	9.21	1	5.26	7	4.76	0	0
81-90	10	2.56	0	0	2	1.36	0	0
Gender	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Male	199	50.9	10	52.63	87	59.18	4	57.14
Female	192	49.1	9	47.37	60	40.82	3	42.86

Table 6. The site of malignant tumors according patient's age

Site	Age distribution										Total
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90		
Thyroid gland	0	7(6.14%)	30 (26.32%)	24(21.05%)	27(23.68%)	15(13.16%)	8(7.02%)	2(1.75%)	1(0.88%)	114	
Head and neck lymph nodes	21(12.14%)	30(17.34%)	29(16.76%)	17(9.83%)	26(15.03%)	16(9.25%)	20(11.56%)	12(6.94%)	2(1.16%)	173	
Larynx	0	0	1(1.64%)	0	5(8.2%)	33(54.1%)	16(26.23%)	5(8.2%)	1(1.64%)	61	
Oral cavity	1(2.27%)	2(4.55%)	1(2.27%)	5(11.36%)	5(11.36%)	12(27.27%)	11(25%)	6(13.64%)	1(2.27%)	44	
Oropharynx	0	0	2(16.67%)	3(25%)	1(8.33%)	4(33.33%)	1(8.33%)	1(8.33%)	0	12	
Nasopharynx	1(3.03%)	3(9.09%)	3(9.09%)	8(24.24%)	5(15.15%)	5(15.15%)	7(21.21%)	1(3.03%)	0	33	
Hypopharynx	0	0	1(12.5%)	0	1(12.5%)	3(37.5%)	3(37.5%)	0	0	8	
Sinonasal	3(27.27%)	0	0	2(18.18%)	1(9.09%)	3(27.27%)	2(18.18%)	0	0	11	
Salivary glands	2(14.29%)	0	1(7.14%)	1(7.14%)	3(21.43%)	1(7.14%)	3(21.43%)	3(21.43%)	0	14	
Ear	0	0	0	0	1(25%)	1(25%)	0	1(25%)	1(25%)	4	
Skin and soft tissue	2(2.78%)	1(1.39%)	0	4(5.56%)	10(13.89%)	12(16.67%)	28(38.89%)	11(15.28%)	4(5.56%)	72	
Bone	3(16.67%)	1(5.56%)	1(5.56%)	2(11.11%)	3(16.67%)	1(5.56%)	3(16.67%)	2(11.11%)	2 (11.11%)	18	

Table 7. The site of malignant tumors according to patient's gender

Site	Gender				Total
	Male		Female		
	Number	Percent	Number	Percent	
Thyroid gland	42	36.84	72	63.16	114
Head and neck lymph nodes	104	60.12	69	39.88	173
Larynx	51	83.61	10	16.39	61
Oral cavity	18	40.91	26	59.09	44
Oropharynx	9	75	3	25	12
Nasopharynx	20	60.61	13	39.39	33
Hypopharynx	6	75	2	25	8
Sinonasal	4	36.36	7	63.64	11
Salivary glands	6	42.86	8	57.14	14
Ear	1	25	3	75	4
Skin and soft tissue	31	43.06	41	56.94	72
Bone	8	44.44	10	55.56	18

Nevertheless, a study in Nigeria reported by Y B Amusa *et al.* showed lymphoma to be the commonest head and neck malignancy but was mainly found in children²⁹, which is similar to the findings in our study since about 66,15% of children and adolescents in the study suffered from lymphoma.

The top five sites involved by head and neck malignancies included head and neck lymph nodes, thyroid gland, skin and soft tissue, larynx and oral cavity, respectively, in a descending order. The result disagrees with several studies, some of which displayed the oral cavity as the commonest site^{3,5,15,21,22,27,29}, others revealed the larynx as the commonest site^{11,14,24,26}, some showed the skin to be the commonest site^{2,18,19}, while a study performed in Bhutan by Phub Tshering *et al.* showed the thyroid gland to be the most effected site³⁰. The differences from these studies may be contributed in part to the variation of genetic background and exposure to risk factors, in addition to the fact that our study included head and neck lymph nodes, thyroid gland, skin, soft tissue and bone, some of which were not included in most of the mentioned studies. As stated previously, after the exclusion of skin, soft tissue and lymph nodes malignancies, oral cavity malignant tumors were the commonest malignancies of the head, with squamous cell carcinoma being the commonest type which is similar to results of Hamideh Kadeh *et al.*¹⁹. The tongue was the most common

location for oral cancer, that was in agreement with several studies^{11,18,26}, although studies reported by Md Salahuddin Siddiqui *et al.*¹⁴ and Hamideh Kadeh *et al.*¹⁹ showed the buccal mucosa to be the commonest site, while Yasmin Bhurgru *et al.*²² exhibited the mucosa cheek as the commonest. The ear was the least affected site and this result is consistent with a study reported by Y B Amusa²⁹.

Squamous cell carcinoma was the most frequent malignancy in our study, and is similar to many literatures done worldwide^{3,12,14,19,20,21,22,24,26,30}. However, a study conducted by Khadijeh Abdal *et al.* showed basal cell carcinoma to be the commonest head and neck malignancy¹⁸. In addition, the study revealed that the top five most frequent histological types of malignant tumors were squamous cell carcinoma, papillary carcinoma, Hodgkin lymphoma, Non-Hodgkin lymphoma and basal cell carcinoma, in descending order, other histological types were less common.

Further sub site analysis in relation to the malignant tumor's histology, revealed that papillary carcinoma was the commonest malignancy of the thyroid gland that is supported by various studies^{2,11,30}, and lymphoma was the commonest malignancy in head and neck lymph nodes that is similar to the finding reported by Rad M. *et al.*². Squamous cell carcinoma was approximately the single type of malignancy identified in the larynx and hypopharynx that is close to findings of other studies^{11,26,30}, and was the commonest

malignancy in the oral cavity and ear which approximates the results of other researches^{11,30}, meanwhile, lymphoma was the commonest malignancy in the oropharynx which is similar to the results of Mohammad Hasan Larizadeh *et al.*¹¹ and Hamideh Kadeh *et al.*¹⁹, nasopharyngeal carcinoma in nasopharynx, that is similar to Phub Tshering results³⁰, embryonic rhabdomyosarcoma in sinonasal region, mucoepidermoid carcinoma in the salivary glands resembling results of salivary glands in other studies^{2,11,30}, basal cell carcinoma was the commonest malignancy in skin and soft tissue that is consistent with other observations^{2,19} and secondary squamous cell carcinoma was the commonest malignancy in bone, as reported by Rad M. *et al.*²

In this study, patients diagnosed with carcinoma were older than those with lymphoma and sarcoma, which is consistent to other studies¹¹. With the exception of the thyroid gland and head and neck lymph nodes, all other sites involved by malignant tumors were more frequent in patients above the age of 40 years i.e. the risk of malignancy in general, increases with age. Furthermore, thyroid gland followed by head and neck lymph nodes were the most frequent sites involved by malignant tumors in females, as compared to males where head and neck lymph nodes followed by the larynx were the most frequent sites.

CONCLUSION

The study revealed that head and neck malignancies in Basrah are mainly a disease of elderly, with slight male predominance. Head and neck lymph nodes, followed by thyroid gland, skin and soft tissue, larynx and oral cavity were the commonest sites involved, respectively, and squamous cell carcinoma was the most frequent malignancy.

Conflict of Interest

The authors declare no conflict of interests.

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