# Incidence of Malignant Neck Masses (MNMs) in Fallujah District , Iraq; Descriptive Cross Sectional Study 2017-2018

**Mohammed Tafash Dagash[1], Haitham Tafash Dagash[2] , Arkan Obaid Jasim Al-Essawi[3], Labeed Saadallah Abdulkareem[4], Mothana Ali Khalil[5]**

*[1]Assist Prof. Dr. University of Anbar, College of Medicine, Department of Surgery, Ramadi, Iraq, [2] Lecturer Dr. University of Fallujah, College of Medicine, Department of Medicine, [3]Assist Prof. Dr. University of Anbar, College of Medicine, Department of Pathology, Ramadi, Iraq, [4]Consultant Ph. D. Fallujah Teaching Hospital, Department of Surgery , Fallujah, Iraq, [5]Assist. Prof. Dr. University of Anbar, College of Medicine,. Department of Microbiology, Ramadi, Iraq*

## Abstract

**Background:** Cancer is one of a major health problem all over the world ,the main factor obstacle facing cancer prevention in our country is a deficiency of epidemiological studies to guide local or international efforts for disease control .

**Objective:** To determine the incidence & risk factors of malignant neck mass in Fallujah District , Anbar province , Iraq .

**Methods:** Proper history include the age , gender , occupation , residence and physical examination include inspection , palpation, auscultation , imaging as ultrasound , chest X-ray , CT scan , Pet scan and in some case Thyroid scan , then Close diagnostic interventions as FNAC, Core –Cut biopsy or Open diagnostic intervention like Incisional ,excisional biopsy were taken from patients with neck mass admitted to surgical unit of Fallujah Teaching Hospital(FTH).

**Results:** Of 207 neck mass cases admitted to surgical unit of FTH , 123 cases ( 59.42%) was malignant neck masses including 53 (43.08% ) and 70 ( 56.91%) recorded in 2017and 2018 respectively. The incidence of malignant neck masses in FTH were 8.26 and 10.91 in 2017& 2018 per 100,000 person per year respectively. Lymphoma considered as a most common MNMs 46 ( 37.39%) followed by Thyroid cancer 45 ( 36.58%) , Carcinoma of unknown origin 20 ( 16.26%) and other type of MNMs 12 ( 9.75%).

**Conclusion**: The incidence of MNMs in Fallujah Teaching Hospital were 8.26 and 10.91 in 2017& 2018 per 100,000 respectively and lymphoma were the most common MNMs.

***Keyword:*** *Malignant Neck Mass, Incidence, Fallujah , Iraq.*

## Introduction

Neck masses are common in adults, but often the underlying etiology is not easily identifiable, while infections most common cause of the neck masses in children. Evidence suggests that a neck mass in the adult patient should be considered malignant until proven otherwise [1,2]. Importantly, an asymptomatic neck mass may be the initial or only clinically apparent manifestation of head and neck cancer, such as squamous cell carcinoma (SCC), lymphoma, thyroid, or salivary gland cancer[2,3].

Timely diagnosis of a neck mass due to metastatic SCC is paramount because delayed diagnosis directly affects tumor stage and worsens prognosis. Unfortunately, despite substantial advances in testing

Corresponding author:
**Mohammed Tafash Dagash**
mohammedtafashthoracic@gmail.com

modalities over the last few decades, diagnostic delays are common [4].

Accurate picture of the demographic and epidemiological profile of neck masses is fundamental for diagnosis., like in the present retrospective analysis each age group showed a frequency for certain diseases, and this can be a guide for ranking differential diagnosis [5]. The present study are design to determine the incidence and risk factors of malignant neck mass in Fallujah District , Anbar province , Iraq

## Methods

A descriptive cross-sectional study was conducted in FTH , Surgery unit during a period between 1st of January 2017 to last day of December 2018. Fallujah region is located in the east of Al-Anbar governorate, Iraq. In Our study divided the Fallujah District into two part central and peripheral (Amerya, Karma ,and Saqlawya). In 2017 - 2018 the total population of Fallujah was estimated as 641,143 person based on report from Fallujah Office of registration, Ministry of planning including 333,880 person of Central of City and 307,263 person of Peripheral of City .

The number of operations that admitted to Surgery unit of FTH are 5650 and 5858 in 2017 and 2018 respectively ( total 11508), every month about 479 cases, every day about 16 cases.

Total neck mass 207 ( 98 , 109 in 2017, 2018 respectively ), only 123 case as MNMs were include in this study (53 cases 43.08% , 70 cases 56.91% in 2017 and 2018 respectively).

The diagnostics have relied on them in neck mass depending on taken proper history include the age , gender , occupation , residence and physical examination include inspection , palpation, auscultation , imaging as ultrasound , chest X-ray , CT scan , Pet scan and in some case Thyroid scan , then diagnostic interventions as FNAC, Core –Cut biopsy or Open diagnostic intervention like Incisional ,excisional biopsy were taken from patients with neck mass admitted to surgical unit of FTH. Informed consent were taken from the patients , Ethical approval was granted by the scientific committee in FTH and Anbar medical college.

## Results

Out of 207 neck mass examinations during two years, 123 (45.5%) patients were diagnosed as having MNMs. Fifty one were male (41.5%) and 72 were females (58.5%) giving a male/female 1:1.4

The range of age was from 4 years to 85 years. The mean age was (39.77±20.08 years). Most of the patients with MNMs presented in age group 41 – 60 (39.8%) followed by 21 – 40 (22%), 20.3% were in age group 61 – 80, while the remaining 17.1% and 0.8% were more than 81years and <= 20 respectively shown in Table 1.

Regarding the smoking, the study showed that 46 (37.4%), 26 ( 21.1%) of MNMs were passive and active smoker respectively while the other 51 (41.5) of MNMs were non smoke .There was no statistically significant between smoker and non- smoker of MNMs patients (Table 1).

The study showed that 86 (69.9%) of MNMs patients were refugee and only 10 (8.1%) of MNMs patients exposure to radiation and 66 (53.7) of those patient live in the peripheral of City while the other 57 (46.3) live in the Central of City (Table 1).

**Table 1. Socio-demographic characteristics and risk factors of MNMs patients**

| Character | No.(%) | Character | No. (%) |
|---|---|---|---|
| **Age** | 39.77±20.08 | **Age Group** | |
| | | <= 20 | 1 (0.8) |
| | | 21 - 40 | 27 (22) |
| | | 41 - 60 | 49 (39.8) |
| | | 61 - 80 | 25 (20.3) |
| | | 81+ | 21 (17.1) |
| **Gender** | | | |
| Female | 72 (58.5) | **Occupation** | |
| Male | 51(41.5) | Farmer | 21 (17.1) |
| | | Teacher | 11 (8.9) |
| | | Painter | 2 (1.6) |
| **Smoker** | | Military | 17 (13.8) |
| | | Student | 24 (19.5) |
| | | Child | 3 (2.4) |
| Active | 26 ( 21.1) | | |
| Passive | 46 (37.4) | House wife | 45 (36.6) |
| Non | 51 (41.5) | | |
| **Migrated (Refugee)** | | **Radiation exposure** | |
| | | No | 113 (91.9) |
| No | 37 (30.1) | Yes | 10 (8.1) |
| Yes | 86 (69.9) | | |
| **Residence** | | | |
| Central of City | 57 (46.3) | | |
| Peripheral of City | 66 (53.7) | | |

The incidence of MNMs were 19.18 Pearson per year/ per 100,000 person during 2017-2018. Of them 8.89 in Central of City while 10.29 in peripheral of City.

In our present study, the diagnostic and interventions tools mentioned in Table3 were used in the diagnosis of MNMs.

**Table 2: Imaging modality and Diagnostic interventions of malignant neck mass.**

| Imaging modality and Diagnostic interventions | Responses No.(%) |
|---|---|
| Ultrasound | 117 (24.2%) |
| Chest X-ray | 99 (20.5%) |
| CT SCAN of Neck and Chest | 65 (13.4%) |
| THYROID SCAN | 29 (6.0%) |
| PETSCAN | 15 (3.1%) |
| Fine Needle Aspiration Cytology | 27 (5.6%) |
| Core biopsy | 45 (9.3%) |
| Incisional biopsy | 29 (6.0%) |
| Excisional biopsy | 58 (12.0%) |

Lymph nodes and thyroid considered as a most common organ origin 52(42.3%) and 42 ( 34.1%) respectively . Of them 98 (79.7%) Primary site origin and 40( 32.5) anterior / Central anatomical site. Sixty seven (54.5%) of MNMs were Painless while the others 56(45.5%) Painful mass as shown in table 3.

**Table 3: Frequency of malignant neck mass according to organ origin, site origin ,anatomical site and clinical feature**

| Character | N (%) | Character | N (%) |
|---|---|---|---|
| **Organ Origin** | | **Site origin** | |
| skin | 6( 4.9) | Primary | 98 (79.7) |
| Muscles | 1(0.8) | Secondary | 25 (20.3) |
| Thyroid | 42( 34.1) | | |
| Lymph nodes | 52(42.3) | **Anatomical site** | |
| Salivary gland | 2( 1.6) | Anterior / Central | 40( 32.5) |
| Vascular | 1( 0.8) | Lateral right | 38(30.9) |
| Bone | 1( 0.8) | lateral left | 36 (29.3) |
| Esophagus | 1( 0.8) | Posterior | 9(7.3) |
| Larynx | 3(2.4) | | |
| Pharynx | 2 (1.6) | **Clinical feature** | |
| Lung | 4(3.3) | Painless mass | 67(54.5) |
| parotid | 8( 6.5) | Painful mass | 56(45.5) |

There was statistically significant in anatomical site of MNMs between male and female (P. Value <0.00).There were non- statistically significant of MNMs between male and female regarding neck mass association with viral infection, site origin and clinical feature (Table 4).

**Table 4 . Association of gender with certain characteristics of malignant neck masses.**

| Character | | Gender | | P. Value |
|---|---|---|---|---|
| Female No. | | Male No. | | |
| Anatomical site | Anterior / central | 33 | 7 | <0.00 |
| | Lateral right | 13 | 25 | |
| | lateral left | 23 | 13 | |
| | Posterior | 3 | 6 | |
| Neck mass association with viral infection | No | 53 | 34 | 0.4 |
| | Yes | 19 | 17 | |
| Site origin | Primary | 62 | 36 | 0.035 |
| | Secondary | 10 | 15 | |
| Clinical feature | painless | 44 | 23 | 0.079 |
| | painful | 28 | 28 | |

Regarding distribution of tumor type of MNMs in male and female, the study showed that only papillary carcinoma were most common in female than male (P.Value = 0.000) whereas the other type of MNMs were not statistically significant between male and female as shown in Table 5.

**Table 5. Tumor type of malignant neck mass by Gender**

| Tumor Type | Female N (%) | Male N(%) | P.Value |
|---|---|---|---|
| Papillary Carcinoma | 31 ( 25.2) | 5 (4.1) | 0.000 |
| Hodgkin's lymphoma | 13 (10.6) | 19 (15.4) | 0.289 |
| Carcinoma of unknown origin | 9 (7.3) | 11 (8.9) | 0.655 |
| Non-Hodgkin's lymphoma | 7 (5.7) | 7 (5.7) | 1.000 |
| Follicular thyroid carcinoma | 6 (4.9) | 0 | - |
| Squamous cell carcinoma | 2 (1.6) | 3 (2.4) | 0.655 |
| Rabdomyosarcoma | 1 (0.8) | 0 | - |
| Bone clavicular tumor sarcoma | 1 (0.8) | 0 | - |
| Bronchogenic carcinoma | 1 (0.8) | 3 (2.4) | 0.317 |
| Anaplastic thyroid carcinoma | 1 (0.8) | 2 (1.6) | 0.564 |
| Carotid body tumor | 0 | 1 (0.8) | - |
| Total | 72 (58.5 ) | 51 (41.5 ) | 0.058 |

Regarding distribution of MNMs depending on anatomical site, the study showed that occupation of MNMs patients were statistically significant in anatomical site (P.Value = 0.000) whereas the residence and Smoking habit

not associated with anatomical site (Table 6).

**Table 6. Association between, residency , occupation and smoking habit of malignant neck mass regarding anatomical Site.**

| Anterior / central N (%) | | Anatomical Site | | | | P .Value |
|---|---|---|---|---|---|---|
| | | Lateral right | lateral left | Posterior | | |
| | | N (%) | N (%) | N (%) | | |
| Residence | Central of City | 20 (35.1) | 16(28.1) | 18(31.6) | 3(5.3) | |
| | Peripheral of City. | 20(30.3) | 22(33.3) | 18(27.3) | 6(9.1) | 0.72 |
| Occupation | Farmer | 4(19) | 11(52) | 6(28.6) | 0(0) | |
| | Teacher | 8(72) | 2(18.2) | 1(9.1) | 0(0) | |
| | Painter | 0(0) | 0(0) | 2(100) | 0(0) | |
| | Military | 3(17.6) | 10(58.8) | 2(11.8) | 2(11.8) | |
| | Student | 4(16.7) | 3(12.5) | 12(50) | 5(20.8) | 0.000 |
| | Child | 0(0) | 1(33.3) | 2(66.7) | 0(0) | |
| | House wife | 21(46.7) | 1124.4) | 11(24.4) | 2(4.4) | |
| Smoking habit | Active | 6 (23.1) | 12(46.2) | 7(26.9) | 1(3.8) | |
| | Passive | 16(34.8) | 13(28.3) | 12(26.1) | 5(10.9) | 0.50 |
| | Non | 18(35.3) | 13(25.5) | 17(33.3) | 3(5.9) | |

## Discussion

This is the first report concerning MNMs incidence in Fallujah region, the evaluation of neck masses is often challenging for health care providers. Present study that showed MNMs increase with ages, and the incidence rate was similar to incidence of all cancer of the other studies in the west of Iraq [6] and in the Middle East [7] , this may reflect prevalence of risk factors coupled with an increase in life expectancy ,and may reflect long term changes in the life style .

The present study showed no association of MNMs with smoking, it was agreement with previous study[8]. Radiation exposure was 10 (8.1%) of patients with MNMs was expected ,as radiation exposure is a common cause of head and neck cancers [9] . This low finding in our study may due to low knowledge about the radiation affect by population, and miss leading by personal thinking .

Present study showed there were increasing in the incidence of MNMs Fallujah during 2017- 2018 and these may be due developing in registration system ,or may related to same factors that lead to increasing in congenital anomalies in Iraq post USA attack which approved to be radiation effect as described previously [10, 11, 12, 13] .

Malignant neck mass incidence was higher in Fallujah periphery sub districts 10.29 per 100,000 population than its center 8.89/100,000, this is probably

due to migrated of center population with history of exposure to periphery of city ,late affect pollution , accumulation of end product of population and exposure of Fallujah periphery to more military operations and battles than its Center in last 15 years .

Core biopsy is an option after an initial inadequate or indeterminate FNA. In a meta-analysis, ultrasound-guided core biopsy was shown to have a high rate of adequacy (95%) and high accuracy (94% and 96%) in detection of neoplasia and malignancy, respectively as well as a low rate of complications (1%) [14] .

Tru-Cut biopsy in 45( 36.6%) it was done while 78(63.4%) it was not done, frequency used Tru-Cut biopsies to take tissue biopsy specially in diagnosis of Lymph node tumor has gradually increased that agreement with other study [15].

In present study Incisional biopsy 29 (23.6%) it was done while 94( 76.4%) it was not done. Excisional biopsy 58(47.2%) it was done while 65( 52.8%) It was not done However, the tissue-healing time is longer after an open biopsy when compared with a needle biopsy, in cases of malignancy, so initiation of treatment may be delayed [16].

Total excision of the MNMs is often preferred in undiagnosed cases for both diagnostic and therapeutic purposes as agreement with another study [17]. Primary ( neck ) 98(79.7%) , secondary 25 (20.3%), most aetiology of MNMS from structures in neck like LN, thyroid , and still metastasis another cause, these findings are similar to the previous research metastasis to head and neck area in Iran[18]., these results was consistent also with the result reported by Sadri et [19] as seen in table 3

The incidence of MNMs in this study was higher in lateral masses when compared with the anterior site of the neck that agreement with a previous reference and research [20] . Although, in this study according symptomatology of MNMs present with painful masses in 56 cases ( 45.5%) while 67 cases ( 54.5% ) not associated with pain, still Patient history and physical examination are fundamental to making an early and correct diagnosis.

Our study was in agreement with other reports that showed the majority of the thyroid carcinomas in the present review were papillary thyroid carcinoma[21].

Although this study is deal with a small group number of cases ,we believe it shed some high light on incidence and the pattern of common MNMs in this region.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest**: The authors declare that they have no conflict of interest.

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