

Cytopathological profile of patients with hepatic lesion: A hospital-based cross-sectional study from North-east India



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ABSTRACT

Background: Cancer is not a notifiable disease in India. The data pertaining to liver cancer and hepatic lesions are very limited in India. **Aims and Objective:** The current study was intended to observe the proportion of different types of liver lesions reported from private hospitals in Mizoram and also to study the association of liver malignancies in relation to gender and age. **Materials and Methods:** This is a cross-sectional study design. The data were collected from the cytopathology data base of a private laboratory (Genesis Laboratory) in Aizawl, Mizoram. Data regarding 204 patients with hepatic lesions, who have been referred from three private hospitals to a private laboratory in Mizoram from January 15, 2018, to November 31, 2021, were included in the study. Details regarding cytopathology reports of image-guided fine needle aspiration cytology of liver mass, age, and gender were collected. Air-dried smears received at a private laboratory were routinely stained with Leishman-Giemsa and Papanicolaou stains, Ziehl-Neelsen staining was done wherever needed. From the cytopathological diagnosis made, the frequency and patterns of various hepatic lesions were then analyzed using SPSS Version 22. **Results:** Out of 204 cases, 15 (7.35%) cases were reported as inadequate samples and 4 cases (1.96%) were inconclusive in diagnosis. Hence, remaining 185 study participants were included in the final analysis. The mean age was 58. Majority 122 (65.40%) were males and in the age group 41–60 years (49.19%). Majority of the lesions were malignant 145 (78.37%) and remaining 40 (21.62%) were benign lesions. The most common malignant lesion found was hepatocellular carcinoma (HCC) 87 (47.02%), followed by metastatic carcinoma 31 (16.75%). Liver malignancies were found to be higher among males (74.5%) as compared to females (14.3%), but were not statistically significant ($P=0.08$). The proportion of males (52.5%) versus females (36.5%) diagnosed with HCC was statistically significant ($P=0.03$). **Conclusion:** The most commonly reported liver malignancy was HCC. The proportion of males diagnosed with HCC was higher than females in the present study.

Key words: Fine-needle aspiration cytology; Hepatocellular carcinoma; Metastatic lesions; Liver malignancy

INTRODUCTION

In India, cancers are not a reportable and notifiable disease. The cancer registries in India are also mostly urban based.¹ The National Cancer Registry Program (NCRP) in India

was initiated in the year 1982. At present, under NCRP, there are 28 Population-based Cancer Register (PBCRs) and 58 Hospital-based Cancer Registries according to the report published by NCRP (2021–2016) and Indian Council of Medical Research.² North-east registries had

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higher incidence rates than the other registries in cancers of oropharynx, oesophagus, nasopharynx, hypopharynx, stomach, colorectal, liver, gall bladder, larynx, lung, cervix uteri, and ovary. Aizawl district had the highest incidence (Age Adjusted Rates, 269.4) in males.²

In the state of Mizoram, cumulative risk of developing cancer of any site in the age group of 0–74 years is one in five for both males and females.² In Mizoram, liver is the fourth most common site of malignancy in males and sixth most common site in females.³ Liver shows a wide range of pathology, focal and diffuse; benign and malignant; primary and metastatic. Radiological examination coupled with morphological assessment by fine-needle aspiration cytology (FNAC) and/or lesional core biopsy is one of the main diagnostic tool in identifying liver pathology.⁴

The incidence of hepatocellular carcinoma (HCC) has risen as a result of increased global burden of chronic liver disease due to hepatitis B and C viral infections. The prevalence of intravenous drug users (IVDUs) are high in the North-eastern region of India, this coupled with unsafe injection practices increase the risk of parentally transmitted viral diseases. According to a study conducted in Aizawl, the prevalence of Hepatitis C Virus antibodies was 71.2% among active IVDUs.⁵

Even though advancements in the field of radiology and imaging have increased the diagnostic accuracy of liver pathology, but still the main diagnostic test to classify the liver pathologies is image-guided FNAC and it still remains the main tool for diagnosing and classifying hepatic lesions in state like Mizoram.⁶

There is very limited data in North-east region pertaining to the proportions of various types of cancers diagnosed by cytopathology using image-guided FNAC.

Aims and objectives

Hence, the present study was undertaken to study the proportion of different types of liver lesions reported from private hospitals in Mizoram and also to study the association of various liver malignancies in relation to age and gender among those population who have undergone image-guided FNAC.

MATERIALS AND METHODS

This is a cross-sectional study design. The data were collected from the cytopathology data base of a private laboratory (Genesis Laboratory) in Aizawl, Mizoram. Data regarding 204 patients with hepatic lesions, who have been referred from three private hospitals to a private laboratory in Mizoram from January 15, 2018, to November 31,

2021, were included in the study. All the patients enrolled during that period were enrolled in the study. Details regarding cytopathology reports of image-guided FNAC of liver mass, age, and gender were collected. Air-dried smears received at a private laboratory was routinely stained with Leishman-Giemsa and Papanicolaou stains, Ziehl-Neelsen staining was done wherever needed. From the cytopathological diagnosis made, the frequency and patterns of various hepatic lesions were then analyzed using SPSS Version 22.⁷ The ethical clearance was obtained from the Institutional Ethical Committee of Zoram Medical College, Mizoram.

Statistical methods

Descriptive analysis was carried out by frequency and proportion for categorical variables and mean and standard deviation for quantitative variables. Categorical outcomes were compared using Chi-square test/Fisher's exact test (If the overall sample size was <20 or if the expected number in any one of the cells is <5, Fisher's exact test was used. P<0.05 was considered statistically significant. IBM SPSS version 22 was used for statistical analysis.⁷

RESULTS

Out of 204 cases, 15 (7.35%) cases were reported as inadequate samples and 4 cases (1.96%) were inconclusive in diagnosis. So remaining 185 study participants were included in the final analysis. Total number of study participants (n)=185. Mean age group of study participants = 58 years. The majority of the study participants belong to the age group of 41–60 years, of which 74.4% were diagnosed with malignant lesions. Only two participants were between the ages of 0 and 20. The majority of study participants were males. Out of 122 male participants, 91 (74.6%) were diagnosed with malignant lesions. Out of 63 female participants, 54 (85.7%) were diagnosed with malignant lesions (Table 1).

The descriptive statistics of type of malignant and benign lesions were shown in Table 2. 87 (47%) of the

Table 1: Characteristics of the study participants (n=185)

Variables	Benign	Malignant	Total (n)
	Frequency n (%)	Frequency n (%)	
Age (years)			
0–20	0	2 (100)	2
21–40	2 (14.3)	12 (85.7)	14
41–60	18 (19.8)	73 (80.2)	91
61 and above	20 (25.6)	58 (74.4)	78
Gender			
Male	31 (25.4)	91 (74.6)	122
Female	9 (14.3)	54 (85.7)	63

145 study participants who had malignant lesions were confirmed to have HCC, and only one other individual had hepatoblastoma. Metastatic carcinoma, which accounted for 16.7% of all liver cancers, was the second most often diagnosed lesion after HCC (Table 2).

The proportion of liver malignancies was found to be higher among participants aged below 60 years (81.8%) when compared to participants aged 60 years and above (74.4%). No statistical significance was noted among the study participants aged 60 years as compared to those aged 60 years (P=0.22). The proportion of liver malignancies was found to be higher among males (74.5%) as compared to females (14.3%). The difference in the proportion of male and female liver cancers was not statistically significant (P=0.08) (Table 3).

The proportion of males (52.5%) diagnosed with HCC was higher than that of females (36.5%). This gender difference in proportion of HCC was found to be statistically significant at P=0.03 (Table 4).

DISCUSSION

The most important requirement for cytopathological diagnosis is to obtain a representative sample and good sample. Image-guided FNAC of liver lesions increases the accuracy of sampling, even for a deeply seated lesion and has proved to be a safe and accurate method for diagnosing liver cancer and metastasis.⁸ Many studies in the literature have validated that image-guided FNA/CB has sensitivity >80% and specificity of 100% in diagnosing various hepatic lesions.⁹⁻¹³

Inadequate sample rate in the present study was 7.36% while Balani et al.,⁸ reported as 5.7%, Bell et al.,¹⁴ and Talukder et al.,¹⁵ reported inadequacy rate of 13% and 6.5%, respectively.

Between 2018 and 2021, a total of 375 hepatic malignancies was registered in PBCRs, Mizoram. Moreover, our study covered 185 cases (38.37%) of these registered patients. Primary malignancy of the liver (HCC) was the most common malignancy and was seen in 60% of all the hepatic malignancies. Swamy et al., also reported higher incidence of HCC than metastatic lesion (36.12% vs. 19.45%).¹⁶ Many other authors have also reported higher incidence of HCC than metastatic lesions^{15,17-19} Kuo et al.,¹⁷ reported 45.6%, 8% by Talukder et al.,¹⁵ 31% by Gatphoh et al.,¹⁸ 26.2% by Rasania et al.¹⁹

In the present study, HCC was found to be more common in male population when compared with female population and the finding was also statistically significant (P<0.05).

Table 2: Description of types of malignant and benign lesions (n=185)

Types of hepatic lesions	Frequency n (%)
Types of benign lesions (n=40)	
Acute liver cirrhosis	1 (0.5)
Benign cystic lesion	2 (1.1)
Hemangioma	3 (1.6)
Inflammatory lesion	2 (1.1)
Liver abscess	3 (1.6)
Liver cell adenoma	1 (0.5)
NMCS	21 (11.4)
Degenerative nodule	7 (3.8)
Type of malignant lesions (n=145)	
Hepatocellular carcinoma	87 (47)
Hepatoblastoma	1 (0.5)
Metastatic adenocarcinoma	7 (3.8)
Metastatic carcinoma	31 (16.7)
Metastatic squamous cell carcinoma	6 (3.2)
Positive for malignancy	13 (7)

NMCS: Non-malignant cells sec

Table 3: Factors associated with liver malignancies (n=185)

Variables	Liver malignancy n (%)			P-value
	Yes	No	Total	
Age (years)				
<60	81 (81.8)	18 (18.2)	99	0.22
≥60	64 (74.4)	22 (25.6)	86	
Gender				
Male	91 (74.5)	31 (25.4)	122	0.08
Female	9 (14.3)	54 (85.7)	63	

Table 4: Factors associated with hepatocellular carcinoma (n=185)

Variables	HCC n (%)			P-value
	Yes	No	Total	
Gender				
Male	64 (52.5)	58 (47.5)	122	0.03*
Female	23 (36.5)	40 (63.5)	63	
Age (years)				
<60	50 (50.5)	49 (49.5)	99	0.3
≥60	37 (43)	49 (57)	86	

*P<0.05

The present study shows that there is association between gender and HCC. Unlike many studies that have reported higher incidence of metastatic carcinoma than primary malignancy,^{6,8,15,19,20} our study showed otherwise. Metastatic tumor was seen in 30.34% of our study and more common in females than in males. Even though the primary sites for these metastatic tumors were not ascertained, cancers of the stomach, lung, breast, cervix, colon, rectal, and pancreatic cancers would be the common sites. Data from PBCR in the North-east region, 2020 showed highest incidence of stomach cancer and lung cancer in Mizoram, and also highest incidence of women breast cancer and cervix uteri in Aizawl district of Mizoram.³

NCRP, 2020, also showed that Aizawl had the highest incidence for cancer of colon, rectal cancer, and pancreatic cancer.⁵ Our study had 8.97% aspirates that were found to be positive for malignancy but the type of malignancy was difficult to establish. Four cases showed the presence of atypical cells and were signed out as an inconclusive report. For such cases, cytology assisted by cell block examination can be an accurate and minimally invasive method to improve diagnostic accuracy of liver lesions. Kuo et al.,¹⁷ in their study concluded that FNAC assisted by cell block examination gives definitive pathologic diagnosis of malignant liver masses. Cytologic sampling is also ideally suited for obtaining tumor cells for molecular studies, as newer trends in personalized molecular targeted therapy require better characterization and prediction of tumor behavior.²¹

Limitations of the study

The present study has brought out the proportion of patients with hepatic malignancies in Mizoram, but this may not be the true prevalence of the disease. For finding out the true prevalence verbal autopsy needs to be carried out in the general population.

CONCLUSION

Aizawl district of Mizoram has the highest incidence of cancer in men, AAR of 269.4/100,000. Liver cancer being fourth most common in male and sixth most common in female population of this state. Having mentioned the high prevalence of IVDUs and its associated risk of hepatitis viral infections, it is undoubtedly clear and believable that the incidence of chronic liver diseases and that of hepatic malignancies will be much higher in the future.

This study highlights not only the patterns of hepatic lesions in Mizoram, but also, most importantly the urgent need of awareness and identification of specific etiological factors, and also to develop multidisciplinary research for development of tools, techniques, and guidelines for cancer control, diagnosis, and treatment of hepatic malignancies.

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