Original article

Evaluation of Space Occupying Lesion of Liver by Fine Needle Aspiration Cytology

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Abstract

Objective : To find out the magnitude of hepatic SOL, its frequency in different age and sex group, viral marker of the study patients and to study the distribution of the cases by different cytological diagnosis.

Methods : This was a descriptive cross sectional study comprising of 48 cases, carried out at the department of pathology, Dhaka Medical College during the period of July 2013 to June 2015.

Results : Results of all patients were collected and tabulated. Statistical analysis was performed on tabulated data. Out of 48 cases, the cytological diagnosis reveal the highest number of cases to be Hepatocellular carcinoma 22(45.8%) followed by metastatic carcinoma 13(27.1%), abscess 6(12.5%), hepatocellular dysplasia 3(6.3%) and negative for malignant cell 4(8.3%).

Conclusion : Fine needle aspiration cytology in case of space occupying lesion of liver can be relied upon to differentiate between benign and malignant lesion and also from primary from secondary.

Key words :

Introduction

Liver diseases are common health problem throughout the world. Liver diseases are broadly categorized as diffuse and focal lesion. The differential diagnosis of focal lesions are primary liver tumors (benign and malignant), metastatic deposits, congenital and acquired cysts and abscess[1].

Appropriate clinical management depends on accurate diagnosis but evaluation of the lesion is a common clinical problem[2]. Imaging techniques and serological markers are useful in narrowing the differential diagnosis. FNAC mainly indicated in the diagnosis of malignant focal lesions both primary and secondary. FNAC also performed to rule out neoplasm from inflammatory lesion when radiologically inconclusive[3-6].

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Hepatocellular carcinoma (HCC) is responsible for a large proportion of cancer death worldwide Also there is demographic variation in the incidence of HCC

The incidence estimated between 2001-2006 shows, 7.8/100,000 persons in Asians and Pacific and 3/100,000 people in U.S.A[7].

GLOBOCAN global analysis published moderately high incidence (11-20 per 100,000) in Southeast Asia and also shows 82% of liver cancer cases occurring in developing country. HCC is preceded by cirrhosis of the liver in most cases. Majority of them are due to viral hepatitis. The life time risk of HCC in chronic hepatitis related to HBV is 10-25% and related to HCV is (1-4)%7. Indeed, worldwide 50-80% of HCC is due to HBV and (10-25)% of cases are due to HCV infection respectively[8]. Dual infection with HBV and HCV is not uncommon in Southeast Asia[9]. Other causes include alcoholic liver disease, nonalcoholic steatohepatitis, intake of aflatoxin contaminated foods, diabetes and obesity[10].

Liver is the most common site of distant metastasis as it filters most of the blood from the body[11]. Metastasis commonly arises from tumor of colon, pancreas, breast and lung. Accurate diagnosis of the metastatic lesions is essential in determining the stage of tumor and also for therapeutic and prognostic purposes. The treatment vary

from palliative care to partial hepatectomy, specially in those which are potentially chemosensitive or hormonally manipulable. Correlation of clinical, laboratory and radiologic findings is necessary. Radiologically multiple nodules of various sizes distributed randomly suggest metastases[5].

The present study was done to evaluate the space occupying lesion of liver by fine needle aspiration cytology. The subjects were studied according to age, clinical features, USG findings and other relevant investigations.

Materials and Methods

This descriptive cross sectional study carried out in the department of pathology, Dhaka Medical College, during the period of July, 2013 to June, 2015. The study was done on fine needle aspiration material of liver SOL that was received from Dhaka Medical College and Hospital, and Bangabandhu Sheikh Mujib Medical University (BSMMU).

Patients with radiologically diagnosed space occupying lesion (SOL) in liver and suspected as a case of hepatic neoplasm were included in this study. Patient with bleeding disorders, prolonged Prothrombin time, patient with liver abscess, cyst and hemangioma and already diagnosed cases were excluded from this study.

Relevant clinical informations were recorded. Clinical data were obtained either directly from the patients or from the clinical history sheet. The necessary and relevant data were kept methodically in a prepared proforma. Patients having suspected hepatic neoplasm with good coagulation profile underwent ultrasound guided FNAC. According to standard protocol FNAC was done by an expert pathologist or radiologist and USG guidance was provided by an expert radiologist. The procedure done in the pathology department, DMC, the Radiology department, DMCH and also in BSMMU. Monitoring of pulse, respiration and blood pressure was done at least 2 hours after aspiration.

Sample processing: Several cytologic smears were prepared and fixed immediately in 95% alcohol. The smears were left in alcohol at least for 30 minutes at room temperature before staining. The residual material remaining after completion of cytologic preparations were fixed in 10% formalin and later processed to prepare paraffin embedded blocks.

Cytological examination:

a) Staining : Smears prepared by USG guided FNA were stained by papanicolaou stain.

b) Cytopathological examination : of the stained slides of hepatic SOL were carried out under light microscope on the same day or next day. Satisfactory smears contained adequate number of representative cells from the target sites. Stained slides were examined to evaluate the nature of lesion.

Results

Table I shows age of the study patients, of them half (50.0%) belonged to the age group 51-70 years. The mean age was found 53.0±15.0 years with range from 18 to 90 years. Three fourth (75.0%) patients were male and 12(25.0%) patients were female. Male female ratio was 3:1(Fig-1).

Table II shows cytological diagnosis of the study patients, almost half (45.8%) patients were found HCC followed by 13 (27.1%) metastatic Ca, 06(12.5%) were abscess and 03(6.3%) were hepatocellular dysplasia.

Table III shows, the presenting complaints of study patients. Total 29 patients present with abdominal pain only, among them 1(33.3%) patients cytologically diagnosed as hepatocellul ar dysplasia, 15(68.2%) HCC, 5(38.5%) metastatic Ca, 5(83.3%) abscess and 3(75.0%) negative for malignancy.

Nine patients presented with abdominal lump and pain by cytological diagnosis. Of them 1(33.3%) hepatocellular dysplasia, 7 (31.8%) HCC and 1(7.7%) was metastatic Ca. One patient (7.7%) having abdominal pain and ascites cytologically diagnosed as metastatic Ca.

Table IV shows 22 patients were cytologically diagnosed with viral marker as HCC. Among them 11(50.0%) were HBsAg positive and 2(9.1%) were Anti HCV positive. No case was dual positive.

In 42 patients the tumor size was >3 cm, among them 2(66.7%) patients cytologically diagnosedsas hepatocellular dysplasia, 22(100.0%) HCC, 13(100.0%) metastatic Ca and 5(83.3%) abscess.

Total 28 patients present with multiple SOL. Among them 2(66.7%) patients cytologically diagnosed as hepatocellular dysplasia, 10(45.5% HCC, 11(84.6%) metastatic Ca, 2(33.3%) abscess and 3(75.0%) negative for malignancy (table-5).

In USG findings 23 patients were diagnosed as secondary metastasis. Among them 2(66.7%) patients were hepatocellular dysplasia, 6(27.3%) were HCC, 12(92.3%) were metastasic Ca and 1(25.0%) were negative for malignancy.

Tables and Fig.

Table I : Distribution of the study patients by age (n=48)

Age (years)	Number	Percentage
≤30	4	8.3
31-50	17	35.4
51-70	24	50.0
>70	3	6.3
Mean±SD	53.0	±15.0
Range	18-90	

Figure 1 : distribution of the study patients by sex

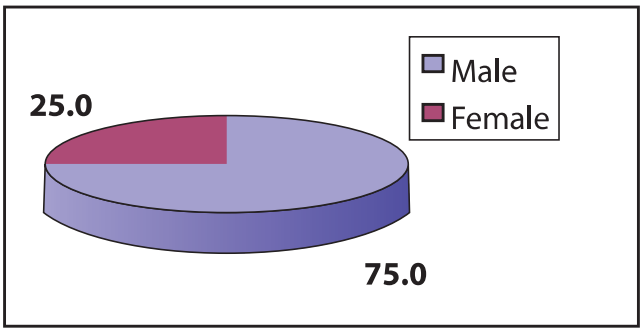

Table II: Distribution of the study patients by cytology

Cytology	Numbers	Percentage
Negative	4	8.3
HD	3	6.3
HCC	22	45.8
Abscess	6	12.5
Metastasic Ca	13	27.1
Adenocarcinoma	9	18.8
Sq. CC	1	2.1
RCC	1	2.1
GIST	1	2.1
Small cell Ca	1	2.1

Table III : Distribution of the study patient with different cytological diagnosis according to clinical feature (n=48)

Clinical feature	Cytological diagnosis									
	Negative (n=4)		HD (n=3)		HCC (n=22)		Metastatic Ca(n=13)		Abscess (n=6)	
	n	%	N	%	n	%	n	%	n	%
Abd lump only	0	0.0	0	0.0	0	0.0	3	23.1	0	0.0
Abd pain only	3	75.0	1	33.3	15	68.2	5	38.5	5	83.3
Lump + pain	0	0.0	1	33.3	7	31.8	1	7.7	0	0.0
Pain + ascitis	0	0.0	0	0.0	0	0.0	1	7.7	0	0.0

Table IV : Distribution of cytologically diagnosed cases with viral marker (n=48)

Viral marker	Cytologcal diagnosis									
	Negative (n=4)		HD (n=3)		HCC (n=22)		Metastaticsic CA(n=13)		Abscess (n=6)	
	n	%	n	%	N	%	N	%	n	%
HBsAg										
Positive	1	25.0	0	0.0	11	50.0	0	0.0	0	0.0
Negative	3	75.0	3	100	11	50.0	13	100.0	6	100.0
Anti HCV										
Positive	0	0.0	0	0.0	2	9.1	0	0.0	0	0.0
Negative	4	100.0	3	100	20	90.9	13	100.0	6	100.0

Table V : Association between cytology status with USG finding (n=48)

USG finding	Cytologica diagnosis										P value
	Negative (n=4)		HD (n=3)		HCC (n=22)		Metastatic Ca (n=13)		Abscess (n=6)		
	n	%	N	%	n	%	N	%	n	%	
Size											
≤3 cm	4	100.0	1	33.3	0	0.0	0	0.0	1	16.7	0.001s
>3 cm	0	0.0	2	66.7	22	100	13	100.0	5	83.3	
SOL											
Single	1	25.0	1	33.3	12	54.5	2	15.4	4	66.7	0.122ns
Multiple	3	75.0	2	66.7	10	45.5	11	84.6	2	33.3	
Diagnosis											
Primary	0	0.0	0	0.0	13	59.1	0	0.0	0	0.0	
Secondary	3	75.0	2	66.7	6	27.3	12	92.3	0	0.0	0.001s
Not diagnosed	1	2 5.0	1	33.3	3	13.6	1	7.7	6	100.0	

Discussion

Many liver diseases particularly neoplasia form focal lesion and are often asymptomatic. Even relevant biochemical tests may not show significant changes12. Diagnosis and management of space occupying lesions in liver is a great challenge. FNA cytology is used in evaluation of SOL in liver. The present study was carried out to evaluate the space occupying lesion of liver by USG guided FNAC.

The mean age of this study cases with hepatic SOL was forth to fifth decades. In Bangladesh Rahman et al (2014) showed similar observations. Similar findings also observed by Nasit et al (2013) in India and Nazir et al (2010) in Pakistan. In this study, the incidence was more in male than female. According to World fact book 2014, the M:F at the peak age of HCC between 31-50 years & 9 male/10 female.

Common clinical features were abdominal pain, lump and other constitutional symptoms. Most of the patients with HCC presented with only abdominal pain. In metastatic group abdominal pain was frequently accompanied by lump in abdomen. Most of the patients with abscess presented with the complain of abdominal pain. Similar observations regarding the clinical presentations were observed in the study done by Nasit et al (2013) and Hossain et al (2010).

Viral marker was significantly positive in patient with hepatic malignancy. Half of the patients with HCC were HBsAg positive and 9% were anti-HCV positive. Rahman et al (2014)13 and Rahman et al (2010)15 also observed similar findings in Bangladesh.

In this study, most of the cytological diagnosis cases of metastatic carcinoma had multiple SOL in USG. Similar findings regarding distribution of cases according to cytological diagnosis was observed by Mohammed et al (2013) and Najir et al (2010). Also there are some overlap in radiologic features of liver abscess, HCC and metastasis16.

Regarding cytological diagnosis of suspected hepatic SOL in this study, hepatocellular carcinoma was more than metastatic neoplasm.

Also metastatic cases include mostly adenocarcinoma. Similar findings were observed by Mohammed et al (2013) and Najir et al (2010).

Conclusion

Treatment modalities are rapidly developing worldwide. Long term survival requires detection of small tumors. FNAC is a safe, minimum invasive procedure and multiple samples can be obtained with the small diameter needle. FNA cytology in case of SOL of liver can be relied upon to differentiate benign and malignant lesion and also primary & secondary lesion. The patients with chronic liver diseases and other known primary lesion need proper evaluation as well as follow up.

Reference

1. Leiman G, Liver and Spleen. In: Ovell SR, Stennet GF, Whitaker D, editors.Fine needle aspiration cytology. 3rded. New Delhi: Churchil Livingstone; 2003. pp 293-316.
2. Swamy M. Arathi CA and Kodardaswamy CR. Value of ultrasonography-guided fine needle aspiration cytology in the investigative sequence of hepatic lesions with an emphasis on hepatocellular carcinoma. J. Cytol, 2011; 28(4): 178-184.
3. Nasit J, Patel V, Parikh B, Shah M, Davara K. Fire-needle aspiration cytology & biopsy in hepatic masses: A minimally invasive diagnostic approach. Clin cancer investing 2013; J : 2 : 132-42.
4. Nazir R, Sharif M, Iqbal M and Amin M. Diagnostic Accuracy of Fine Needle Aspiration Cytology in Hepatic Tumors. J of the college of Physicians & surgeons Pakistan 2010; 20(6): 373-376.
5. Conrad R, Castelino-Prabhu S, Cobb C, Raza A. Cytopathologic diagnosis of liver Mass lesions. J of Gastrointestinal Oncology. 2013; 4(1).
6. Asghar F & Riaz S. Diagnostic Accuracy of percutaneous cytodiagnosis of Hepatic Masses by Ultrasound guided Fine Needle Aspiration Cytology. 2010; ANNALS.; 16.
7. Ng J. Wuu J. (2012) Hepatitis B related and Hepatitis C related Hepatocellular Carcinoma in the United States; Similarities and Differences Hepat Mon, 2012, 7635.
8. Venook A.P, Papandreou C, Furuse J, Guevara L.L.D. The incidence and epitemiology of Hepatocellular carcinoma: A Global and Regional Perspective. The Oncologist 2010; 15 (Suppl 4) : 5 -13.
9. Liu Z, Hou J. Hepatitis B Virus (HBV) and Hepatitis C Virus (Hq) Dual infection. Int J. Med Sc. 2006; 3(2): 57-62.
10. Sanyal A. J, Yoon S.K and Lencioni R. The Etiology of Hepatocellular Carcinoma and Consequences for Treatment. The Oncologist, 2010; 15 (suppl 4): 14–22.
11. Haque S, Dilawar A and Subzwari J. Ultrasound Guided Fine-Needle Aspiration Biopsy of Metastatic Liver Disease : A Comparative Assessment of Histological & Cytological Techniques. 2012; 28.

12. ThimmaiahV.T.Evaluation of focal Liver Lesions by Ultrasound as a Prime Imaging Modality. Scholars Journal of Applied Medical Science (SJAMS). 2013:6(6):1041-1059.

13 Rahman F. Role of Cytology .Cell block and Immunohistochemistry in Differentiating Hepatocellular Carcinoma from Metastatic Tumors in Liver. 2014; Unpublished MD thesis, BSMMU, Bangladesh.

14. Hossain M. Characterization of Focal liver mass by computed Tomography scan with Cytopathological Correlation. 2010; Unpublished MD thesis, BSMMU, Bangladesh.

15. Rahman AA. Prevalence of Primary HCC &Secondaries in liver in it attending Dept of Gastr& Hepatology in BSMMU. 2010; Unpublished MD thesis, BSMMU, Bangladesh.

16. Charles E, Ray MD, William S, Rilong MD Current Imaging Strategies of primary & Secondary Neoplasm of the liver. Sem: Int: Rad: 2006; Mar: 23(1): 3-12.

17. Mohammed AA Elsiddig S, Abdul Hamid M, Gasim G and Adam I. Ultrasound guided fine needle aspiration cytology and cell block in the diagnosis of focal liver lesions at Khartoum Hospital, Sudan. 2012;7.