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Cytopathological Study of Peritoneal Washings and Ascitic Fluid in Gynaecological Malignancies with Histopathological Correlation

Dr. Puja A Pingle[1*], Dr. Sujata R Kanetkar[2], Dr. Sangeeta J Pawar[3], Dr. Robina M Nazeer[1], Dr. Sonal O Gupta[1], Dr.Chetan Khurana[1]

[1]Post graduate student, [2]Professor & Head of Department, [3]Assistant Professor, Department of Pathology, Krishna Institute of Medical Sciences, Deemed to be University, Karad, Maharashtra, India

***Corresponding author:** Puja Annasaheb Pingle
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Abstract **Original Research Article**

Background: Gynaecological malignancies are one of the leading causes of morbidity and mortality in women. Early detection and prompt management is the key to improve survival rate among affected so we planned to do study of cytopathological examination of peritoneal washings and ascitic fluid in gynecological malignancies as it is a simple & inexpensive method and correlate the findings with histopathological diagnosis and clinical information to arrive at staging and local spread of disease. ***Aim & objectives*:** To study cytopathology of peritoneal washings and ascitic fluid in gynaecological malignancies with histopathological correlation along with clinical details in gynaecological malignancies and to correlate cytopathological findings with staging of gynaecological malignancies. ***Material and methods*:** This study was carried out in Department of Pathology of a tertiary care hospital. This was a cross sectional study of cytopathological examination of peritoneal washings and ascitic fluid in gynaecological malignancies with histopathological correlation. Period of study was 2 years from June 2016 to May 2018, which includes 40 cases. ***Results*:** In present study total 40 samples from cases of Gynaecologic malignancies were received from our hospital which includes 14 samples of ascitic fluid (35%) and 26 samples of peritoneal wash (65%) for cytopathological studies. Out of 40 gynaecological malignancies, ovarian malignancies predominates (87.5%) ***Conclusion:*** Cytopathological examination of ascitic fluid and peritoneal washing greatly aids in supporting the diagnosis, in predicting the prognosis and chance of recurrence of the tumor that in turn helps in proper management and treatment of the patients.

Keywords: Peritoneal washings, Ascitic fluid, Gynaecologic malignancies.

INTRODUCTION

Gynaecological malignancies are one of the leading causes of morbidity and mortality in women [1]. Early detection and prompt management is the key to improve survival rate among affected. Methods of detection of microscopic disease are therefore of significant interest and may reduce mortality rate by enabling an earlier diagnosis of gynaecological malignancies [2].

Ascitic fluid cytology and peritoneal washings is important tool that help in diagnosis and prognosis of gynaecological malignancies. Peritoneal washings were initially described in 1956 for the evaluation of gynecologic malignancies. The purpose of this procedure was to diagnose "early" spread of cancer [3]. The presence of malignant cells in peritoneal washings reflects intraperitoneal spread of the neoplastic process beyond the primary organ site. When this occurs, it often correlates with a poor prognosis in variety of tumors.

We planned to do study of cytopathological examination of peritoneal washings and ascitic fluid in gynecological malignancies as it is a simple & inexpensive method and correlate the findings with histopathological diagnosis and clinical information to arrive at staging and local spread of disease.

MATERIAL AND METHODS

This study was carried out in Department of Pathology of a tertiary care hospital. This was a cross sectional study of cytopathological examination of peritoneal washings and ascitic fluid in gynaecological malignancies with histopathological correlation. Period of study was 2 years from June 2016 to May 2018, which includes 40 cases.

Peritoneal washings and ascitic fluid from cases of gynaecologic malignancies were included and peritoneal washings and ascitic fluid from non gynaecological malignancies and other cases e.g.tuberculosis etc. were excluded.

Methods

Following proper collection and processing of fluid specimens, 2-4 smears were immediately wet fixed by placing them in cytofixative (50% ether-alcohol). After fixation wet fixed smears were stained with H&E.

Air dried smears were fixed in 100% methanol and stained with Giemsa stain. H&E and Giemsa stained smears were studied under the microscope for presence of malignant cells. Results were interpreted as whether cytological specimens were positive or negative for malignant cells. Results of peritoneal washings and ascitic fluid cytology were correlated with various histologic features of gynaecologic malignancies including histologic type, tumor size, grade, capsular invasion and omental metastasis.

Out of 40 fluid samples received, 10 showed presence of clot. These clots were separated, transferred to 10% buffered formaline for overnight fixation and processed as routine histopathology specimens. Patient's information, clinical details and relevant data was recorded on specially designed proforma. All results were statistically processed and tabulated.

OBSERVATIONS AND RESULTS

In present study total 40 samples from cases of Gynaecologic malignancies were received from our hospital which includes 14 samples of ascitic fluid (35%) and 26 samples of peritoneal wash (65%) for cytopathological studies. Maximum number of patients were seen in 7th decade (age group 61-70) (32.5 %) followed by 5th and 6th decade. Age of the youngest patient was 11yrs and that of the oldest was 70 yrs. Mean age of presentation in this study was 50.57years. The commonest presenting symptom was abdominal pain seen in 32/40 (80.0%) cases studied followed by abdominal mass in 21/40 cases i.e. 52.5% and 20/40 (50%) cases presented with abdominal fullness. Complaint of difficulty in micturition was present in 6/40 cases. (15%) On gross examination, all samples of peritoneal wash (26/26 i.e 100%) were reddish in colour with hazy to turbid appearance. Majority of ascitic fluid samples (10/14 i.e 71.42%) were reddish in colour with hazy to turbid appearance and 4/14 (28.58%) samples were yellow in colour.

Table-1: Distribution of cases based on Cytopathological Diagnosis

Diagnosis	Peritoneal washings	Ascitic fluid	Total	Percantage
Positive for Malignant cells	14	9	23	57.5%
Negative for Malignant cells	12	5	17	42.5%
Total	26	14	40	100%

Table-2: Distribution of cases based on Histopathological Diagnosis

	Histopathological Diagnosis	Number of Cases	Percentage
Cervical carcinoma			
	Squamous cell carcinoma cervix	1	2.5%
Endometrial carcinoma			
	Mod diff adenocarcinoma	3	7.5%
	Clear cell carcinoma	1	2.5%
Ovarian malignancy			
Surface epithelial tumors	Serous cystadenocarcinoma	23	57.5%
	Borderline serous papillary malignancy	1	2.5%
	Mucinous cystadenocarcinoma	1	2.5%
	Borderline Mucinous malignancy	2	5%
	Endometrioid carcinoma	1	2.5%
Germ cell tumors	Dysgerminoma	3	7.5%
	Teratoma With Squamous cell carcinoma	1	2.5%
Sex cord stromal tumor	Granulosa cell tumor	1	2.5%
Epithelial stromal tumor	Malignant Mixed Mullerian Tumor	1	2.5%
Metastatic	Metastatic Adenocarcinoma (Krukenberg)	1	2.5%
	Total	40	100%

DISCUSSION

Ascitic fluid and peritoneal washing cytology is a useful indicator of surface involvement and peritoneal dissemination by gynaecologic malignancy. It may identify subclinical peritoneal spread and thus provide valuable staging and prognostic information [4]. For the same reason, peritoneal washing cytology is implemented in ovarian cancer guidelines and is routinely performed in surgeries of gynaecologic malignancies. In the present study, peritoneal wash

cytology and ascitic fluid findings were studied along with emphasis over its correlation with histological parameters, i.e., tumor type, tumor grade, capsular invasion, and omental metastasis. Maximum number of patients was seen in 7th decade which was similar o studies done by Chakrabarti *et al*. [2] and Muhabat Q *et al*. [6] who also observed maximum number of cases in 7th decade. The youngest patient was 11 yr old having dysgerminoma and the oldest was 70 yrs old having serous cystadenocarcinoma ovary. Mean age of all patients with gynecologic malignancies was 50.57 Yrs. Our study findings were comparable to other studies done by Samreen Naz *et al*. [7] 2015 and Jaswani *et al*. [8] where mean age was 48.9 and 49.9 yrs respectively.

The commonest symptom was abdominal pain (32/40, 80% followed by abdominal mass (21/40, 52.5%) and abdominal fullness (20/40, 50%). Our findings are comparable with findings in the studies done by Yasmin J *et al*. [9] and Muhabat Q *et al*. [6]. 10 out of 40 samples (25%) showed presence of clot. These clots were separated and processed as routine histopathology specimens and proved to be of help in case of suspicion of malignant cells on cytology. Out of 10 samples of clot for processing, only one was having adenocarcinoma cells on H & E stained sections and others were inconclusive and were showing only fibrinous material. Jalal *et al*.[10] in 2009. In study, 23/40 (57.5%) cases were positive for malignant cells & 17/40 (42.5%) were negative on cytopathological examination. Similar findings were observed in the studies done by Samreen Naz *et al*. [5], and Jaswani *et al*. [8], whereas Chakrabarthi *et al*. [2] Jangam *et al*. [5] found more negative cases. Out of 35 cases of ovarian malignancy capsular invasion was present in 21 (60.0%) cases and absent in 14 (40.0%) cases. Our findings were comparable with study by Jaswani *et al*. [8] where capsular invasion was present. Omental metastasis is used as a standard to determine the sensitivity and specificity of peritoneal washing and ascitic fluid cytology. In this study, out of 35 cases of ovarian malignancies, omental metastasis was present in 19 (54.29%) cases and absent in 16 (45.71%) cases. Our findings are comparable with study by Jaswani *et al*. [8].

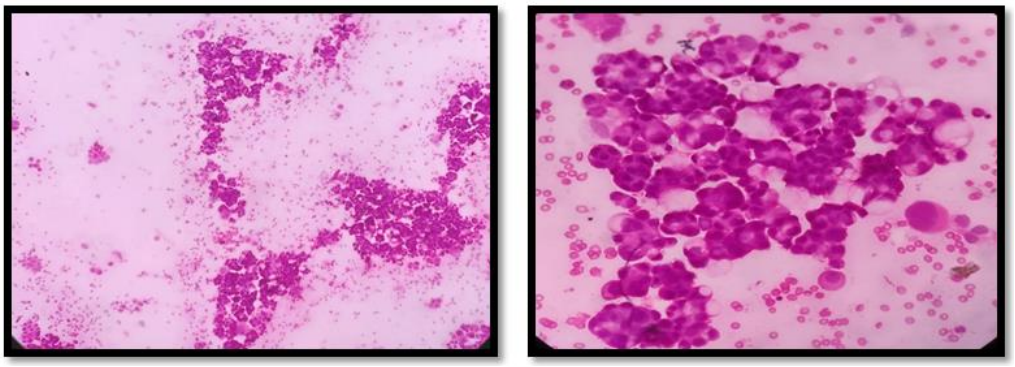

Fig-1: Photomicrograph showing fluid cytology with neoplastic cells arranged in clusters & 3D balls in case of adenocarcinoma. (H&E) (a) - 100X & (b) - 400X

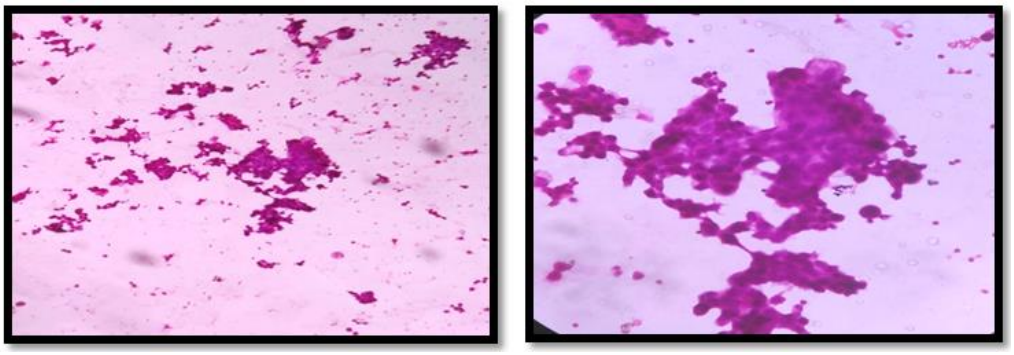

Fig-2: Photomicrograph showing fluid cytology withneoplastic cells arranged in clusters and few are singly located with marked nuclear abnormality in a case of squamous cell carcinoma. {H & E, a) 100x, b)400x}

Tumour grade has an impact on abdominal spread of ovarian as well as endometrial cancer. In the present study, we found out that 17 (42.5%) out of 40 cases of gynaecologic malignancies had high histological grade, 16/40 (40.0%) had intermediate grade and 7/40 cases (17.50%) had low grade. Our findings were comparable with the study done by Samreen Naz *et al.* [7].

In present study, 16/35 (45.71%) cases of ovarian malignancy had tumour size less than 10 cm, 17/35 (48.57 %) cases had size 10-20cm and 2/35 (5.72%) cases had size more than 20cm .Our findings

were comparable with study done by Samreen Naz *et al*. [7], where 33/60 (55%)cases of ovarian malignancy had tumor size less than 10 cm, 19/60 (31.6 %) cases had size 10-20cm and 8/60 (13.3%) cases had size more than 20cm.

Out of 40 cases of gynaecologic malignancies, 17/40 (50.0%) were stage I, 02/40 (5.0%) were stage II, 19/40 (47.5%) were stage III and 2/40 (5.0%) were stage IV. These findings were similar to the findings of studies done by Muhabat Q *et al*. [6]

CONCLUSION

- Cytopathological examination of ascitic fluid and peritoneal washing greatly aids in supporting the diagnosis, in predicting the prognosis and chance of recurrence of the tumor that in turn helps in proper management and treatment of the patients.
- There is significant correlation between cytological findings of peritoneal washing and ascitic fluid with histopathological subtype, tumor size, tumor grade, capsular invasion, omental metastasis, of ovarian malignancies. This can be used as an adjunctive tool in the surgical management of ovarian malignancies.

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