International Journal of Life Sciences, Biotechnology and Pharma Research Vol. 13, No. 9, September 2024 Online ISSN: 2250-3137
Print ISSN: 2977-0122

DOI: 10.69605/ijlbpr_13.9.2024.39

ORIGINAL RESEARCH

Application of Indian academy of cytologists guidelines 2020 for reporting serous effusions

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Received Date: 22 July, 2024 Acceptance Date: 25 August, 2024

ABSTRACT

Background: Serous cavity effusions comprise a large number of cytology specimens in every cytopathology setup. Cavity effusion specimens play a crucial role in patients clinical management. The guidelines and categories for reporting serous effusioncytology (*IACGRSE*) was introduced by The Indian Academy of Cytologists (IAC)in 2020. Thus aim of the study was to introduce uniform system of reporting serous effusion in cytopathology of ourdepartment and to analyse interobserver variability among participants using IACGRSE 2020 categories along with category wise agreement. **Material and methodology:** A cross-sectional prospective study was carried out over a period of 2 months. The samples of serous cavity were routinely processed and reporting was done according toIACRSE 2020 by two investigators. Kappa statistics were used to assess the diagnostic utility, feasibility and interobserver variability. **Results:** Age ranged between10 years to 92 years with themean age of 54.14 ± 20.331 of the participants. There were 34 (64%) males in the present study. Maximum cases were Ascitic fluid 28 (56%). Observer 1 analysed 60% cases as Category II and observer 2 analysed 68% cases as category II. Kappa statistics showed a substantial significant agreement between 2 observers with Kappa value of 0.675% and 67.5% agreement. (p value-0.000). **Conclusion:** Interobserver agreement showed a Substantial agreement among the observers. IACGRSE 2020 categories can be used for reporting and interpretations of serous lesions.

Keywords: IACGRSE, serous cavity effusion, kappa statistics, diagnostic criteria, interobserver agreement.

INTRODUCTION

Serous effusion isan accumulation of excess fluid in the body cavities, namely, pleural, pericardial, and peritoneal, the latter also referred to as ascites. Effusion indicates an underlying pathology and constitutes an important diagnostic sample in clinical practice, including oncology.[1]

A unified nomenclature classify various diagnostic cytology for pathologists and clinicianshelps in better patient management. The Bethesda System forReporting of Cervical Cytology is the first and major successstory, yet again emphasizing the need and actual utility of suchsystems.[2]

Reporting systems for urine, thyroid, salivary gland,and cervical cytology are already present.[3,4,5,6] However, serous fluid being one of the mostcommon specimens processed by cytopathology laboratories,a uniform reporting terminology and system is still lacking. Therefore, guidelines and categories for reporting serous effusioncytology (*IACGRSE*) was introduced by The Indian Academy of Cytologists (IAC)in 2020. In order to achieve consistency and reproducibility in the reporting of fluid specimens, this system was developed. It provides detailedguidelines for the reporting of cells under each category. Along with clear recommendations for the clinicians.Very few studies have been done to assess the consistency and reproducibility of theIACGRSE 2020.

Therefore, the present study was carried out to introduce uniform system of reporting serous effusion in cytopathology of ourdepartment and to analyse interobserver variability among participants using IACGRSE 2020 categories along with category wise agreement.

MATERIAL AND METHODOLOGY

Aprospective cross-sectional studywas carried out at the Cytology Unit, Department of Pathology, Government Medical College (GMC), Jammu, JK-UT

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over a period of 2 months, for Jan 2024 to Feb 2024.Ethical clearance was taken institutional ethics committee of GMC, Jammu.

A total of 50 samples of serous cavity effusion fluids were taken in the study. Inclusion criteria was all the serous fluid samples (Pleural, pericardial and peritoneal/ascitc) received in the department of pathology. Exclusion criteria was samples < 1ml and haemorrhagic fluid sample. Two expert cytopathologist who were principal investigator and co-investigator analysed and interpreted the samples separately.

Cases ofserous effusion smears with relevant clinical, radiologicaldetailsand histopathological follow-up were taken. There was clinical and/or radiological evidence of malignancy in all the cases. There was no preanalytical issues related to fluid processing. Eachcase had two smears, one air-dried MGGstained and one wet fixed Papanicolaou stained smear forexamination. Light microscopy was used for cytomorphological evaluation. The interpretation was recorded by the two investigators in a given format.

All the caseswere categorized into one of the five recommendeddiagnostic IACGRSE 2020 categories individually. The criteria is as follows:I. Unsatisfactory. II. No Malignant cells/Benign cellularchanges. III. Atypical cells, not otherwise specified (NOS). IV.Atypical cells—Suspicious of Malignancy. V. Malignant cellsseen.[1]

The participants cytological interpretations classified bythe IACGRSE 2020 categories were analysed for interobserveragreement by category using Kappa statistics.

RESULTS

A total of 50 cases were analysed by 2 investigators. The ages ranged from 10 years to 92 years with themean age of 54.14 ± 20.331 of the participants. There were 34 (64%) males in the present study. (Table1, Figure 1) Maximum cases were Ascitic fluid 28 (56%) (Table 2)

Category wise observations among observer1 and observer 2 are presented in table 3 and figure 2. Maximum agreement was seen in category I and category V between the observers. Observer 1 analysed 60% cases as Category II and observer 2 analysed 68% cases as category II. (Table 3, Figure 2) Kappa statistics showed a substantial significant agreement between 2 observers with Kappa value of 0.675% and 67.5% agreement. (p value-0.000) (Table 4)

Table 1: Gender Distribution among study participants

Gender	Frequency	Percentage (%)
Male	32	64.0
Female	18	36.0
Total	50	100.0

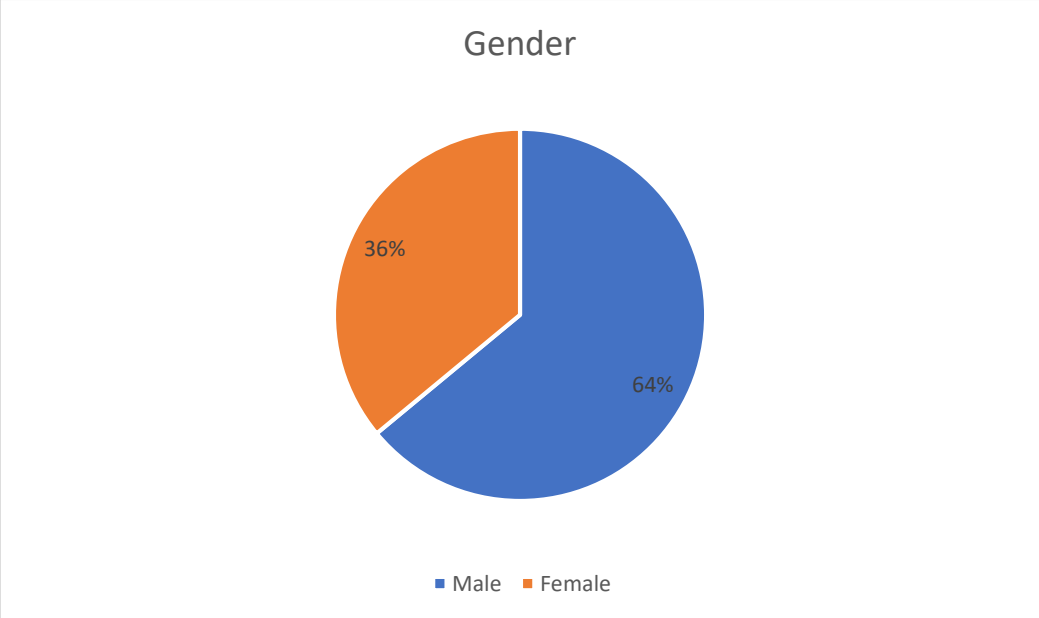

Figure 1: Gender Distribution among study participants

Table 2: Distribution of type of fluid

Type of fluid	Frequency	Percentage (%)
Ascitic fluid	28	56.0
Bal fluid	2	4.0

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Ganglion fluid	1	2.0
Pelvic fluid	2	4.0
Pericardial fluid	1	2.0
Pleural fluid	15	30.0
Synovial fluid	1	2.0
Total	50	100.0

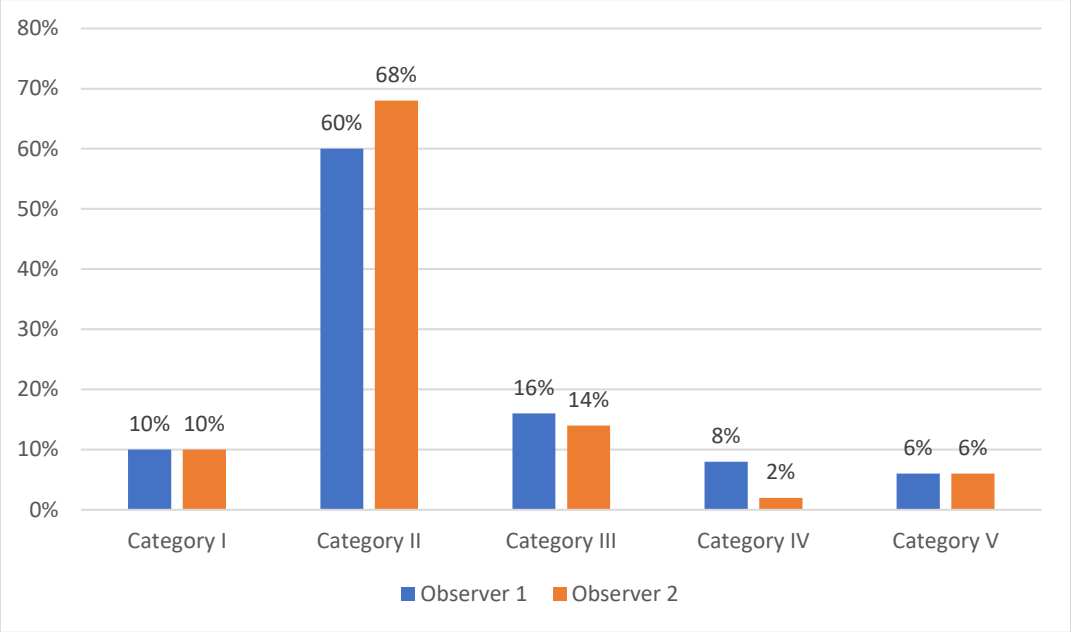

Figure 2: Category wise observations analysed by observer 1 and observer 2

Table 3: Category wise observations analysed by observer 1 and observer 2

IACGRSE 2020	Observer 1		Observer 2	
	No	Percentage (%)	No	Percentage (%)
Category I- Unsatisfactory.	5	10.0	5	10.0
Category II-No Malignantcells/Benigncellularchanges.	30	60.0	34	68.0
Category III- Atypical cells, not otherwise specified (NOS).	8	16.0	7	14.0
Category IV- Atypical cells—Suspicious of Malignancy.	4	8.0	1	2.0
Category V- Malignant cellsseen.	3	6.0	3	6.0
Total	50	100.0	50	100.0

Table 4: Kappa value and interpretation between Observer1 and Observer 2

Observer1*observer 2	Kappa value	Interpretation	Percent agreement	Significance
Number of cases (50)	0.675	Substantial agreement	67.5%	0.000**

*P-value ≤ 0.05 Significant; **P-value ≤ 0.01 Highly Significant

DISCUSSION

In the present study, 2 observers analysed 50 samples of serous cavity effusion fluids and cytological interpretations were classified as per IACGRSE 2020 categories. This system was introduced by The Indian Academy of Cytologists (IAC)in 2020 to achieve consistency and reproducibility in the reporting of fluid specimens.

Our study comprised of 50 samples reporting to the Department of Pathology, GMC Jammu. It comprised of 64% males and 36% females patients. (Table1, Figure 1)In a study done Kundu R et al.,[7] by there were 51.7% male and 48.3% female patients. Study done by **Kalita** DJ et al.,[8] also had 51.1% male and 48.9% female.

In the present study the ages ranged from 10 years to 92 years with themean age of 54.14 ± 20.331 of the participants. Study done by Kundu R et al., showed ages ranged from 7 months to 92 years with mean age of 49.07 ± 19.07 years.[7]

Maximum cases were Ascitic fluid 28 (56%), followed by pleural fluid 15 (30%). (Table 2) Similar results were seen in study done by Nagose VB et al.,[2] where maximum cases (53%) were Ascitic fluid, followed by pleural fluid (40%). Kundu R et al., observed majority of the effusions as pleural effusions

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(79.5%), followed by peritoneal (14%) and pericardial (6.5%) effusions.

In the present study it was observed that both the observers had maximum agreement in category I and category V, where similar results were observed by both the observers. Out of 50 samples, observer 1 observed 30(60 %) samples as category II and observer 2 observed 34 (68%) samples as category II. However, there was overall substantial significant agreement between the 2 observers. In the present eight cases showed different results as analysed by the observers. In a study done by Nagose VB et al.,[2]twelve cases showed majordiscordance that is, a difference of two or more categories.The discordance between observer was due to paucity and distribution of cells.

The aim of IACGRSE 2020 to achieve uniformity, consistency andreproducibility in fluid cytology seems to be achieved well asevident from the present study, where interobserver agreement was found out to be 67.5%. A substantial agreement was found out with a significant kappa value-0.675.(Table 4) Similar results were seen in study done by Nagose VB et al.,[2]wherethe range of Kappafor interobserver agreement of fellows was fair to substantial (range 0.1692–0.7249).

Major limitation of the study was the sample size, which was small.Secondly more observers with experience can give better interobserver variability.

CONCLUSION

Interobserver agreement showed a Substantial agreement among the observers. IACGRSE 2020 categories can be used for reporting and interpretations of serous lesions. This tool allows all casesto be reported with definitive impression as there are twospecified categories allotted to the atypical cells.

The IAC diagnostic categories and reporting format of categorisation of serous effusion cytology samples is feasible and appropriate guidelines that can be used in the Department to report serous effusion cytology samples

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

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