

## ORIGINAL RESEARCH

# Comparative Analysis of Liquid-Based Cytology with Conventional Cytology in Evaluation of Abdominal Masses: An Institutional Based Study

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### ABSTRACT

**Background:** The present study was conducted for comparing the liquid-based cytology (LBC) with conventional cytology in evaluation of abdominal masses. **Materials & Methods:** A total of 20 pediatric patients who reported with presence of clinically palpable and/or radiologically detectable abdominal lesions were enrolled. Complete demographic and clinical details of all the subjects was obtained. Spreading of the aspirates was done on clean glass slides and were air-dried as well as fixed in 95% ethanol for staining. Rinsing of the same syringe was done into liquid-based collection vial, which consisted of methanol-based preservative solution. Processing of material was done followed by single smear staining with Papanicolaou stain and one with hematoxylin and eosin stain. As per manufacturer's instructions, processing of samples for LBC was done. After preparation of slides from both the methods, they were compared. All the results were recorded and analysed using SPSS software. **Results:** Higher performance of conventional smear in comparison to LBC smear in terms of cellularity, architecture, cytoplasmic preservation, and nuclear preservation was seen in 20 percent, 65 percent, 80 percent and 30 percent of the cases respectively. Higher performance of LBC smear in comparison to conventional smear in terms of cellularity, architecture, cytoplasmic preservation, and nuclear preservation was seen in 10 percent, 0 percent, 0 percent and 5 percent of the cases respectively. **Conclusion:** Liquid based cytology is an expensive technique and has less diagnostic utility when used alone.

**Key words:** Liquid Based Cytology, Abdominal Masses.

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### INTRODUCTION

The management of an abdominal mass requires a holistic approach which commonly entails clinical, radiological, surgical and/or histopathological evaluations. Clinicians are usually desirous of a cost-effective imaging tool to facilitate the diagnostic process. A widely available, affordable and easily accessible imaging modality is indispensable to prompt management. Ultrasonography is the most readily available imaging modality.<sup>1,2</sup>

At presentation, patients may be asymptomatic or report a wide range of associated symptoms, including fever, hematuria, and abdominal pain or distension. New-onset hypertension may be the first sign of an abdominal mass. The child's age, associated symptoms, location of mass, and laboratory findings provide important clues to the underlying cause and can direct appropriate evaluation and consultation.<sup>4</sup> Liquid-based cytology (LBC) is a new method of preparing cervical samples for cytological

examination. Unlike the conventional 'smear' preparation, it involves making a suspension of cells from the sample and this is used to produce a thin layer of cells on a slide. The new intervention would thus form part of the process of population screening to reduce the incidence of invasive cervical cancer.<sup>5-7</sup>Hence; the present study was conducted for comparing the liquid-based cytology (LBC) with conventional cytology in evaluation of abdominal masses.

## MATERIALS & METHODS

The present study was conducted for comparing the liquid-based cytology with conventional cytology in evaluation of abdominal masses. The study was carried out over a time period of 6 months. A total of 20 pediatric patients who reported with presence of clinically palpable and/or radiologically detectable abdominal lesions were enrolled. Complete demographic and clinical details of all the subjects was obtained. Collection of ultrasound-guided fine-needle aspirate and cell block was done. In few cases, the aspirate was collected post-surgical from the surgical specimen before they were immersed in formalin. Subjects with presence of confirmed inflammatory or traumatic etiology were excluded from the present study. Spreading of the aspirates was done on clean glass slides and were air-dried as well

as fixed in 95% ethanol for staining. Rinsing of the same syringe was done into liquid-based collection vial, which consisted of methanol-based preservative solution. Processing of material was done followed by single smear staining with Papanicolaou stain and one with haematoxylin and eosin stain. As per manufacturer's instructions, processing of samples for LBC was done. After preparation of slides from both the methods, they were compared. All the results were recorded and analysed using SPSS software.

## RESULTS

A total of 20 cases were analysed. Correlation between conventional smear and LBC smear in terms of cellularity, architecture, cytoplasmic preservation, and nuclear preservation was seen in 70 percent, 35 percent, 20 percent and 65 percent of the cases respectively. Higher performance of conventional smear in comparison to LBC smear in terms of cellularity, architecture, cytoplasmic preservation, and nuclear preservation was seen in 20 percent, 65 percent, 80 percent and 30 percent of the cases respectively. Higher performance of LBC smear in comparison to conventional smear in terms of cellularity, architecture, cytoplasmic preservation, and nuclear preservation was seen in 10 percent, 0 percent, 0 percent and 5 percent of the cases respectively.

**Table 1: Comparison of Conventional smear and LBC smear**

Cytological parameters	Conventional smear = LBC smear	Conventional smear > LBC smear	LBC smear <Conventional smear
Cellularity	14	4	2
Architecture	7	13	0
Cytoplasmic preservation	4	16	0
Nuclear preservation	13	6	1

## DISCUSSION

Palpable abdominal masses may arise from the abdominal cavity or the abdominal wall. The differential diagnosis is broad for each variant ranging from benign lipomas, inflammatory processes, to malignant tumors. The imaging approach to diagnosis varies by location. For intra-abdominal masses, contrast-enhanced CT and ultrasound examination have demonstrated accuracy. For abdominal wall masses, which may arise from muscle, subcutaneous tissue, or connective tissue, MRI, CT, and ultrasound all provide diagnostic value.<sup>8-10</sup>Hence; the present study was conducted for comparing the liquid-based cytology with conventional cytology in evaluation of abdominal masses.

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nuclear preservation was seen in 20 percent, 65 percent, 80 percent and 30 percent of the cases respectively. In a study conducted by Singh et al, authors assessed the efficacy of liquid-based cytology (LBC) as a method for cytological follow up and detection of recurrence in treated cases of cancer cervix. Pap smear and LBC were taken in all cases. Colposcopy and biopsy were done for those having epithelial cell abnormality in cytology report. Colposcopy and biopsy were taken as gold standard for diagnosis of cancer cervix recurrence. Ninety-four treated patients of carcinoma cervix were studied. The diagnostic accuracy for detection of recurrence of conventional Pap smear was 79.16 per cent, and that of LBC was 97.6 per cent. The difference between the two methods was significant ( $P < 0.001$ ). Their findings showed that LBC performed better than the conventional method of cytology to detect recurrence of squamous cell carcinoma.<sup>10</sup>

Higher performance of LBC smear in comparison to conventional smear in terms of cellularity, architecture, cytoplasmic preservation, and nuclear preservation was seen in 10 percent, 0 percent, 0

percent and 5 percent of the cases respectively. Pawar PS et al established manual liquid-based cytology (MLBC) technique on fine-needle aspiration cytology (FNAC) material and compare its results with conventional technique. In their study, authors examined cells trapped in needles hub used for the collection of FNAC samples. 50 cases were examined by the MLBC technique and compared with the conventional FNAC technique. By centrifugation, sediment was obtained, and imprint was taken on defined area. Papanicolaou (Pap) and May-Grünwald Giemsa (MGG) staining was done. Direct smears and MLBC smears were compared for cellularity, background, cellular preservation, and nuclear preservation. Slides were diagnosed independently by two cytologists with more than 5 years' experience. Standard error of proportion was used for statistical analysis. Cellularity was low in MLBC as compared with conventional smears, which is expected as remnant material in the needle hub was used. Nuclei overlap to a lesser extent and haemorrhage and necrosis was reduced, so cell morphology can be better studied in the MLBC technique. P value obtained was <0.05. This MLBC technique gives results comparable to the conventional technique with better morphology.<sup>11</sup>

## CONCLUSION

Liquid based cytology is an expensive technique and has less diagnostic utility when used alone.

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