Inadequate clinical data on Pap test request form: Where are we headed in the era of precision medicine?

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ABSTRACT

The request form accompanying any sample to a clinical laboratory constitutes an important communication tool between the clinician and the laboratory personnel. Much has been written about the inadequacy of pertinent clinical data on the request slips for hematology and biochemistry tests and its impact on the subsequent test interpretation and error liability. Although the cytology laboratories, including those performing cervical cytology, have to deal with a similar problem of lack of clinical information critical to the proper interpretation of cytomorphologic features, the issue has not been attended to or reported adequately in the literature. This article attempts to explore this topic of inadequate clinical data on Pap test request form from multiple perspectives and suggest possible ways to circumvent this age-old problem. These recommendations may be tailor-made and adopted as per the individual laboratory’s logistics.

Keywords: Clinical data, Digitization, Importance, Pap test, Request form

INTRODUCTION

The requirement of close collaboration between the clinicians and pathologists was eloquently emphasized as early as 1908 by Stow in his elegant writing, “the correlation of clinician, pathologist, and layman.”[1] Much to the frustration of everyone involved in the process of patient care, this collaboration is still circumstantial, coming to the fore only in discrepant cases where the pathology report does not corroborate the clinical diagnosis. The adequacy of relevant clinical information on the test request form continues to be a matter of dispute, with some physicians withholding the information out of ignorance about its importance or due to lack of time to fill up the details in the request form.[2] The pathologists need to share the responsibility of improving this clinico-pathologic communication by conveying to the clinicians the essentiality of relevant clinical details for best pathologic interpretation of the sample received in the laboratory.[3] The same holds true for the Pap test request forms where certain clinical information is imperative for accurate interpretation of the cytomorphological features and appropriate advice for further workup of the patient.[4] However, an extensive review of the available literature yielded only occasional reports highlighting the topic of adequacy of clinical data on Pap test request form.[5,6]

This article presents the cytopathologists’ perspective encompassing various issues related to the importance of availability of adequate and pertinent clinical information on the Pap test request form along with suggested ways of solving this perpetual problem.
ROLE OF CLINICOPATHOLOGICAL CORRELATION IN PATHOLOGY REPORTING

It is an age-old teaching in pathology that interpretation of cytological or histological features of a case must always take into account the clinical data that may include review of previous cytology or histology slides and radiological findings. However, the implementation of this teaching in actual practice is far from being perfect. One of the major reasons for this shortfall is the lack of adequate clinical details on the pathology test request forms. Although this problem of insufficient clinical data is prevalent across all subspecialties of medical laboratories, most attention in the medical literature has been focused on its impact upon hematology and biochemistry reports. Studies have shown that incomplete clinical data on request forms were the most frequent reason of preanalytical errors in hematology or biochemistry reports. In their study, Agarwal et al. demonstrated a significant improvement in the quality indicators involving sample rejection through educational intervention of the laboratory, medical, and nursing staff. This training included educating the staff about the various steps of sample collection with special emphasis on provision of relevant clinical details on the request forms.

The issue of missing clinical data in surgical and cytopathology specimen request forms has not been discussed to a great extent in the medical literature. A study from a teaching hospital in Nigeria reported that only about half of the surgical pathology specimens were accompanied by adequate clinical information. The adequacy of clinical information on surgical pathology requests has been shown to affect the turnaround times (TATs) of the breast, soft tissue, and skin specimens in an elaborate study by Ali et al. Similarly, a laboratory-based audit from Kenya reported that only 55% of the cytology request forms had sufficient clinical information or provisional diagnosis. An interesting report by Bull et al. emphasized that pathologists do not possess extrasensory perception and hence are not able to decipher the clinical information unless provided in the request forms.

IMPACT OF COMPLETENESS OF CLINICAL DATA ON SPECIMEN ADEQUACY CRITERIA, SECOND REVIEW, DIAGNOSIS, AND MANAGEMENT IN CERVICAL CYTOLOGY PRACTICE

Pap test request form is the only window available to the cytopathologists to gain access to critical information such as symptoms, local examination findings, menstrual history, and details of any previous abnormal Pap result or surgical intervention. Although these details may be considered mundane by the staff filling out the request form, they are extremely essential for good-quality reporting of the Pap test, especially for selecting smears of screen-negative cases with high-risk dispositions for review. Although the Clinical Laboratory Improvement Amendments (CLIA’88) allow the laboratories to solicit patient identification and clinical details, the specimen rejection criteria in the guidelines usually do not include inadequate clinical information as a reason. The specific criteria for accreditation of medical laboratories issued by the National Accreditation Board for Testing and Clinical Laboratories (NABL) also mention that the gynecological cytology request form should contain details of menstrual phase, hormonal status, hormone therapy, contraception, and previous surgery. However, the sample rejection criteria for Pap test have not been defined by the NABL. The Bethesda System for Reporting Cervical Cytology 2014 also mentions the need of interpretation of the cervical smear findings in context of clinical details provided in the request forms.

QUALITY OF CLINICAL INFORMATION CURRENTLY BEING PROVIDED ON THE PAP REQUEST FORM

Anecdotally, cytopathologists have always been dismayed by the highly inadequate clinical information provided by the clinical colleagues on the Pap test request forms. However, these grudges have not been adequately brought out in peer-reviewed literature for the benefit of cytopathologists and awareness of the gynecologists. A study published in 2009 asserted that no peer-reviewed literature existed on the accuracy of data on Pap test request forms. In this study, 12% of the request forms had no clinical information. Of the cases having pertinent computerized records, 25% had information on the request forms to classify them as high risk, suitable for rescreen. However, a further 7% met the high-risk criteria only after accessing the computerized records, and of these, 67% had no clinical history at all in the request slip. A more recent study from Brazil reported the absence of relevant clinical information in 40.9% of the request forms examined, with the highest frequency being the indication for the Pap test examination. Such reports underscore the importance of provision of adequate clinical information on the Pap test request forms since reporting guidelines advocate rescreen of 10% of negative cases, especially of the high-risk category. The category of high risk is labeled on the basis of clinical presentation, a previous abnormal Pap result, follow-up smear of a woman treated for high-grade lesion or screen-positive women on visual inspection with acetic acid, visual inspection with Lugol’s iodine, or high-risk human papillomavirus (HPV)-DNA.

Unpublished results of a study by the lead author of this article revealed that though the history of prior abnormal Pap test was mentioned in 17% of high-risk cases, the laboratory
accession number was not provided in majority of such cases, thus hindering a review of the previous smear. Similarly, the information on use of hormonal contraception or hormone replacement therapy was not mentioned on the request forms and had to be sought in 5% of cases where the smear pattern did not match the age of the woman mentioned on the request form (NK, personal communication). Apart from the problems with smear interpretation, inadequate clinical information may also lead to an unnecessary increase in the TAT of Pap test reports, especially in cases where the smear morphology does not seem to correlate with the sketchy clinical details provided. This delay, however, is imminently avoidable by adhering to the best practices while filling the request forms.

This issue would become amply clear with some hypothetical yet potentially real examples. A Pap smear in a 32-year-old female with atrophic pattern would lead to a recommendation for hormonal evaluation. However, availability of clinical information of progesterone therapy or the patient being in postpartum period or lactational amenorrhea can justify the smear pattern in such cases and avoid this recommendation. Similarly, the absence of transformation zone component in a smear from a 48-year-old female would prompt the cytopathologist to append this finding to the report for further evaluation by the clinician, even though the absence of endocervical cells is no longer considered as criteria for unsatisfactory smears. However, if the cytopathologist is informed of the history of prior hysterectomy due to a benign condition or a high-grade cervical lesion, it would change the pathologists’ perspective of interpreting the smear. Another similar but clinically serious situation could be the lack of clinical examination findings on the request form of a postmenopausal female with atrophic smear having marked inflammation and few atypical squamous cells which are obscured by the dense inflammation. The availability of local examination findings of ulcerated ectocervix with exudates and clinical suspicion of carcinoma in such a case can alert the cytopathologist to be extra diligent in searching for atypical cells and evaluating them accordingly.

In the current era, HPV-based cervical cancer screening as well as HPV vaccination is being increasingly employed in cervical cancer control. The information on prior HPV testing and its result, if available, needs to be communicated to the cytopathologist for a subsequent Pap smear evaluation, especially in the event of HPV test being positive. Similarly, details of HPV vaccination status of the woman, whose Pap smear is under evaluation, would become increasingly important considering the anticipated reduction in squamous intraepithelial lesions with widespread uptake of vaccination. In addition, the HPV testing and vaccination status would need to be taken into consideration during Pap smear reporting of certain glandular lesions such as clear cell, serous, mesonephric, and gastric-type adenocarcinomas and their precursor lesions, which have been shown to be unrelated to HPV.\textsuperscript{16,17}

**GAPS IN KNOWLEDGE OF CLINICIANS AND BARRIERS IN PROVIDING ADEQUATE CLINICAL DATA**

Naryshkin \textit{et al}. carried out a survey which revealed that 95% of the surveyed clinicians and 96% of the staff were aware of the significance of clinical information for the cytopathologist. Notably, three-quarter of the respondents knew that the laboratory should be informed about a prior high-grade lesion or previous gynecologic surgical intervention in a woman. In spite of the clinicians’ awareness, the adequacy of clinical information on Pap test request form was not 100%. The authors concluded that the clinicians wanted to be made aware of the pathologists’ expectations regarding the clinical data and a structured request slip containing adequately represented criteria facilitating filling of the form in a short time.\textsuperscript{5} A knowledge-attitude-practice survey by the lead author (NK, unpublished data) demonstrated that only about half of the clinicians were aware that high-risk cases were subjected to a second review, even if considered as negative by one pathologist. The survey revealed that other reasons leading to inadequate clinical details included lack of a structured request form, unavailability of the relevant information with the clinician due to the health facility hopping by the patient and lack of time to fill the form in a busy clinic.

**USE OF GOOD QUALITY CLINICAL DATA ON PAP TEST REQUEST FORM**

Good documentation on the Pap smear request form is critical to produce accurate high-quality reports, provide recommendations for follow-up, and ensure patient safety by avoiding errors in reporting.\textsuperscript{18-20} Apart from being a necessary requirement for laboratory accreditation,\textsuperscript{14} it is also a valuable resource for postgraduate training in pathology, research, and publications. Hence, it cannot be overemphasized that adequate and pertinent clinical data are essential on the Pap test request form, as with all other laboratory requests.

**CLINICAL DATA REQUIREMENT FOR DEVELOPING ALGORITHMS FOR PAP SMEAR SCREENING USING ARTIFICIAL INTELLIGENCE**

Manual screening of conventional Pap smears is fraught with high false-negative rates due to the propensity of screening errors. Hence, computer-assisted screening of Pap smears
is being attempted to improve the accuracy of cytology reporting. Given that the computer-assisted screening is based on predesigned algorithms, it is prudent for these algorithms to incorporate relevant clinical data to be able to achieve the desired accuracy in screening and avoid unnecessary flagging of smears for cytopathologists’ review.

POSSIBLE SOLUTIONS TO THE AGE-OLD PROBLEM: DIGITIZATION OF LABORATORY ALONG WITH HOSPITAL (DIGITAL HOSPITAL INFORMATION SYSTEM AND LABORATORY INFORMATION SYSTEM)

There could be several scenario-specific effective approaches to effectively reduce the lack of information available to the laboratory. These may be implemented depending on the resources and individual laboratory’s settings. The first and most important is breaking the virtual walls and instituting effective communication between the clinician and pathologist as to their mutual expectations from each other. Computerization, including online patient data entry and its linkage with the Laboratory Information System, if resources permit, may serve as an effective solution, though even with such systems in place, pathologists may find it difficult to access every patient's details on the computer.[8]

Another workable solution is the designing of a user-friendly, simple yet specific request form with minimum essential list of items in a checkbox-type configuration, for the clinicians to fill out in the least possible time. While designing such a form, close collaboration is essential between the laboratory staff and clinicians and other personnel involved in filling out the Pap test request form. This would ensure a good understanding of the request form and lead to better compliance in providing adequate and relevant clinical data.

CONCLUSION

The issue of lack of pertinent clinical information on Pap test request form needs to be discussed openly with the clinical colleagues as the first step toward finding effective solutions and ensuring the best care for the patients. The reasons for not providing complete essential data include the lack of appreciation of its importance by the clinicians, lack of knowledge about its impact on selection of cases for the second review, and non-availability of specific structured request form. These may be rectified by creating specific Pap smear request forms, educating the clinicians on the importance of providing adequate clinical data in improving result accuracy, and regular feedback on the quality of data received. Adherence to these best practices can substantially augment the effectiveness of cervical cancer screening and thereby, contribute in reducing the burden of cancer cervix.

COMPETING INTERESTS STATEMENT BY ALL AUTHORS

The authors declare that they have no competing interests.

AUTHORSHIP STATEMENT BY ALL AUTHORS

All authors of this article declare that we qualify for authorship as defined by ICMJE http://www.icmje.org/#author. Each author has participated sufficiently in the work and takes public responsibility for appropriate portions of the content of this article. NK, RG, and SG conceived the idea, conducted literature review, wrote and critically reviewed the article. All authors read and approved the final manuscript.

ETHICS STATEMENT BY ALL AUTHORS

This study was conducted with approval from the Institutional Review Board of the institution associated with this study. Authors take responsibility to maintain relevant documentation in this respect.

LIST OF ABBREVIATIONS (In alphabetic order)

CLIA - Clinical Laboratory Improvement Amendments
HPV - Human Papilloma Virus
NABL - National Accreditation Board for Testing and Clinical Laboratories
TAT - Turnaround time

EDITORIAL/PEER-REVIEW STATEMENT

To ensure the integrity and highest quality of CytoJournal publications, the review process of this manuscript was conducted under a double-blind model (the authors are blinded for reviewers and vice versa) through automatic online system.

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