DELAY IN TURNAROUND TIME IN REPORTING SMALL BIOPSY SPECIMENS: AN EXPERIENCE FROM A TERTIARY CARE HOSPITAL IN LAHORE

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Abstract

Background & objectives: Turnaround time (TAT) is defined as time lapse between receiving of a specimen at laboratory reception till dispatch of the final histopathological diagnosis. TAT is not only an efficient indicator of laboratory performance but is the most important concern of practicing physicians dealing with histopathology report. The aim of this study was to analyse the delay in turnaround time of different types of small biopsy specimens in histopathology section.

Methods: A cross sectional analysis was done on 218 different types of small biopsy specimens reported by histopathology section. Delay in turnaround time involving different phases of testing was observed and data was entered using SPSS version 26.

Results: The mean turnaround time in this study was 6.66 days. Majority of the reports were reported after a delay of 4-7days (n=83). Causes in delay mostly included recuts 69 (31.65%), re-orientation 22 (10.09%), intradepartmental consultation 52 (23.85%) and troubleshootings in LIS 16 (7.33%). Inappropriate supervision and training of newly hired technical staff was a major factor in ordering of recuts, reorientation and restains.

Conclusion: Turnaround Time, a measure of quality assurance, is essential to the efficient operation of a successful histopathology laboratory. The patient's anxiety is reduced and timely treatment is assisted by proper TAT.

KEYWORDS: Delay, phase, turnaround time.

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Turnaround time (TAT) is defined as time lapse between receiving of a specimen at laboratory reception till dispatch of the final histopathological diagnosis. TAT not only indicates an efficient indicator of a laboratory performance but is the most important concern of practicing physicians dealing with histopathology report.[1] Almost every allied branch of medicine and surgery is somehow dependent upon a histopathology input for establishing a definitive diagnosis. A timely reported specimen with the most accurate diagnosis can help the clinician to devise a prompt and definitive treatment plan.[2,3] Delay in issuance of Histopathological results in good time contributes to prolonged patient's treatment times, decreases satisfaction, and increases hospital cost.[4,5]

Many factors play an important role in delaying of histopathology reports especially in case of small biopsies where our end user expects relatively short turnaround time as compared to large biopsies and complex resections.[5] Laboratory TAT is determined by the timely progress of 3 phases of testing: pre-analytical, analytical and post-analytical.[6]

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The pre-analytical phase of tissue processing comprises of all the steps starting from receiving of tissue specimens until the submission of histopathology slides for interpretation.[7] Analytical phase begins when slides are prepared till the result is interpreted and finalizing the reports. The post analytical phase constitutes proofreading, verification and dispatch of the results.[8]

The TAT of different laboratories can be different depending upon the availability of resources and this can be shortened to help the patients, clinicians and also for continuous quality improvement of the patient.[8,9,10]

A study done by Emmanuel I, reported a reporting time of 27.7% of the total time spent.[4] The aim of this study is assess the factors resulting in delay in reporting small biopsy specimens.

METHODS

A cross-sectional study was conducted at Pathology department, Postgraduate Medical Institute / Ameer-ud-Din Medical College / Lahore general Hospital, Lahore from 1st June 2023 to 30th June 2023. Sample size of 218 reports was calculated at 95% confidence interval with 8.6% absolute precision and expected sensitivity as 96%, expected specificity as 100% and expected prevalence as 60%. [3]

The samples were included by non probability convenient sampling and were tracked from the generation of samples at clinical ward and submission at histopathology reception till dispatch of the report.

The biopsies included were endoscopic biopsies, tru cut biopsies, endometrial pipelle sampling, lymph node biopsy and skin biopsies whereas cytology specimens included smears, fluids, aspirates and frozen sections. Specimen insufficient for processing and autolyzed samples were excluded from the study.

Pre-analytical phase constituted from generation of small biopsy specimen till submission at histopathology reception.

Transport time: TT constituted from generation of small biopsy specimen till submission at histopathology reception. Therefore, TT constitute the pre-analytical phase. The grossing time (TG) is the time (in days) between sample submissions and grossing of the submitted specimen section for processing. It includes the fixation time as well. Processing time (TP) the time from processing to generation of glass slides submitted for histopatho-logical analysis to residents and reporting consultants. Reporting time (TR) represents the period of reporting till case typing and dispatch of the report to reception. TG & TP constitute the analytical phase.

Finally, the reporting time (TR) represents the postanalytical phase. It is the time during which the diagnosis is made, reports undergo typing, proofreading, printing and ready for collection/dispatch. All times were consecutive calendar days including the weekend. There were no ethical issues as the research does not involve the direct use of patients' information or diagnosis reached on samples, but strictly time intervals.

We divided the delay in turnaround time in 3 categories

a) 1-3 days
b) 4-7 days
c) 8-10 days

Data was entered in SPSS-version 26. Quantitative variables like number of biopsy fragments and biopsy size were presented as mean +/- standard deviation. Qualitative variables like biopsy type, requesting ward and phase of test were presented as frequency and percentage. p value less than equal to 0.05 was taken as significant.

RESULTS

A total of 218 reports of small biopsy specimens were analysed in a duration of one month. Different types of biopsy specimens were categorized in figure 1. Mostly gastric biopsies were delayed because of frequent recuts and less often due to ancillary testing. Skin biopsies reporting delay was as a result of biopsy reorientation and recuts, special and immunohistochemical stains and case discussion in multidisciplinary meetings. (Table 1) The mean turnaround time in this study was 6.66 days.

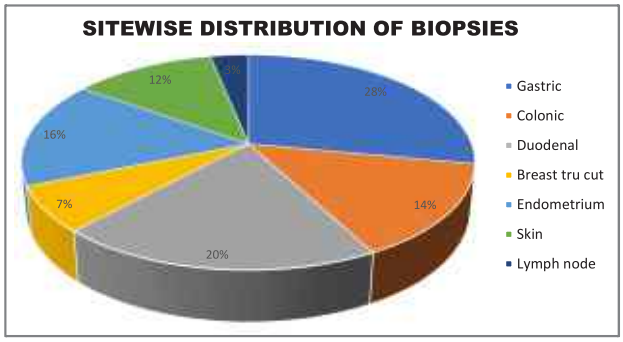

Figure 1: *Delay in Turnaround Time of Different Types of Small Biopsy Specimens*

Figure 2: *No. Of days Delayed in Turnaround Time of Small Biopsy Specimens*

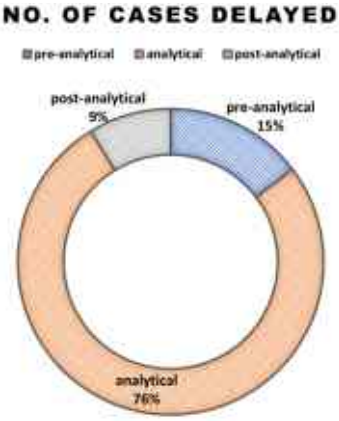

Figure 3: *No. of Cases Delayed According to the Test Phase*

Delay in turnaround time of specimens in which ancillary testing was advised were because of technical issues including troubleshooting in autostainers, reagent shortage and issues related to purchase and supply of reagents. Inappropriate supervision and training of newly hired technical staff was a major factor in ordering of recuts, reorientation and restains. (Table1)

The number of days delayed was mostly 4 to 7 days (65%). (Figure 2) Whereas very few cases of small biopsy specimens were delayed for 2 weeks or more (n=8, 13%). The reason for the delay are mentioned in Table 1.

Table 1: *Causes of delay in turnaround time of small biopsy specimens*

REASON FOR DELAY	NO. OF CASES (n=218)
Recuts	69 (31.65%)
Special stain	15 (6.88%)
Immunohistochemistry	25 (11.46%)
Intradepartmental discussion	52 (23.85%)
Case discussion in multidisciplinary meeting	19 (8.71%)
Reorientation & re-embedding	22 (10.09%)
Troubleshooting in LIS	16 (7.33%)

DISCUSSION

One of the most crucial tools doctors employ to effectively oversee the quality and safety of patient care is timely anatomical pathology reports. Therefore, confirming pathology findings in a timely manner aids healthcare professionals in accurately diagnosing patients which will result in an efficient treatment strategy.

Behind the scenes, histopathologists play a significant role in providing the clinician with the diagnosis on the basis on which the subsequent therapy plan is carried out.[2,3] Based on the data, it was observed that roughly 26% of cases were delivered after a delay of 4-7days, whereas 18.3% of surgical pathology cases were reported after the 1-3days delay in turnaround time advised by statutory bodies. (Fig 2)[4] The Pathologist continuously meets the needs of the Clinicians by working with the Laboratory Medicine specialists.[5] Many scholars have proposed many models in the past to study TAT in surgical pathology laboratories.[6,7,8] A key indicator of how well a laboratory is serving the needs of its clients is the turnaround time (TAT) for a histopathological laboratory test. Previous research has revealed a variety of variables that can affect turnaround time including

a) Selecting and ordering the test b) collecting the specimen and delivering it to the laboratory c) accessing the specimen and delivering the specimen within the laboratory d) reporting and finalizing results & communicating to the clinician. Similar to the last study, this one used the strategy of adding a "log sheet" to the clinician's request form to cut down on TAT. The factors impacting effective TAT and the consequent corrective actions to be made in their correspondence are clearly shown in the following table. To evaluate performance and efficiency in the processes performed to ensure optimal TAT, various models are implemented and their results are assessed.[7,8,9]

When evaluating the level of reporting in histopathology, TAT is crucial. It is an essential variable that patients and professionals use to evaluate the effectiveness of any lab. Since the majority of clinicians are dissatisfied with the reporting time, TAT is also associated with the lowest satisfaction rates among them.[5]

TAT has an impact on medical care since a shorter TAT aids in early illness detection and treatment. It is clear that needless difficulties might negatively affect patient outcomes if a diagnosis is delayed.

The mean turnaround time in this study was 6.66 days which was more than the study done at mayo hospital for gastrointestinal biopsies,[13] but shorter (11.10 days) than the study at Nigeria.[4, 19, 21] This quicker recovery in Lahore, Pakistan compared to our study and Nigeria parallels the disparity in health advancements between developed and underdeveloped nations, which is an unquestionable or developmental indication. Additionally, this study's turnaround time exceeded the College of American Pathologists' recommendation that 90% of routine biopsies be signed out within two days.[7]

Although most laboratory services aim to produce speedy and reliable reports at a fair price, it has been shown that most laboratories place an unnecessary emphasis on dependability alone, whereas clients are more concerned with how soon (TAT) a report will be made available to them.

Simple administrative procedures could drastically shorten the TAT and raise the standard of the central laboratory's services. These include installing sample collection counters at the outpatient and inpatient departments (OPD and IPD), using simple techniques like printing the location of the laboratory on the OPD ticket, implementing a single-prick policy, designating the central laboratory as a separate department, and unifying administrative control under one authority.[6,11,12,13]

In their study, prolonged TAT was associated with immunohistochemical (IHC) staining, diagnosis of a malignant disease, having the opinion of other pathologists and correlation with frozen sections results, recuts and restain.[13,15,20]

On lymph nodes, breast tissue, and skin biopsy samples, additional recuts and certain stains must be used. Numerous prognostic indicators, such as ER, PR, and HER2/neu, are performed if carcinoma is discovered in a breast tissue sample in addition to recuts. In our situation, skin biopsy samples are typically submitted to reorientation, application of different special and immunohistochemical stains to determine a definite pathological diagnosis. To rule out specific lymphoproliferative disorders, special and immunohistochemical stains are routinely applied to lymph node tissues. (Table 1)

The study's limitations include its limited sample size, the wide range in what is considered "Turnaround Time," and its focus on just English-language arcticles. In future, we can include other tissue types, large and complex resection specimens in our research article.

CONCLUSION

Turnaround Time, a measure of quality assurance, is essential to the efficient operation of a successful histopathology laboratory. The patient's anxiety is reduced and timely treatment is assisted by proper TAT. The TAT is greatly shortened when a well-organized log sheet is attached to the histology request form. It also helps with the creation of future corrective actions. Additionally, it is clear from the current study that tiny,

straightforward changes instead of complex one can lead to significant advancements in quality assurance.

Conflict of Interest *None*

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