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Pathology

Study of Factors Affecting Turnaround Time in Biopsy Specimen at Tertiary Care Hospital

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Abstract **Original Research Article**

Background: This study aims to audit analytic turnaround time (TAT) in a histopathology laboratory with a view to assessing the timeliness of its reports, identify causes of delay in its turnaround time. Short turnaround time facilitates prompt decision-making in patient management and this influences hospital stay and cost of hospitalization. The size of the institution, extent of automation, and number of personnel, among other factors may affect the laboratory's mean TAT. The turnaround time for issue of reports should not exceed 4 days (As per NABL guidelines).***Objectives:*** To identify the causes of delay in turnaround time in a histopathology laboratory. ***Materials and Methods:*** 3000 specimens processed over a 10 month period in the histopathology laboratory of tertiary care hospital were included in our study. From these, mean turnaround time were calculated and causes of delay identified. To identify the causes of delay a register was maintained which included date on which biopsy was received, date of reporting and date of dispatching report and reason of delay if it took more than four working days. ***Results:*** Turnaround time for 73.2% cases was within four working days. The delays in timeliness of report generation were due mainly to tissue processing-related factors (4.3%), history of patient (13%), additional and deep sections (3.8+4.8%) and ancillary additional studies (0.9%). ***Conclusion:*** Biopsy reports were delayed mainly due to history of the patient (48.5%), deep sections (17.91%), reprocessing (16.05 %), additional sections (14.8%) and ancillary additional studies (3.36%)

Keywords: Biopsy, Turnaround time, causes of delay.

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INTRODUCTION

This study aims to audit analytic turnaround time (TAT) in a histopathology laboratory with a view to assessing the timeliness of its reports, identify causes of delay in its turnaround time.

Short turnaround time facilitates prompt decision-making in patient management and this influences hospital stay and cost of hospitalization.

The size of the institution, extent of automation, and number of personnel, among other factors may affect the laboratory's mean TAT [1].

The turnaround time for issue of reports should not exceed 4 days (As per NABL guidelines).

The laboratory for this study is in a tertiary health facility where not only pathology services are rendered, but residency training in pathology is also offered.

It is semi-automated and receives specimens from within and outside its parent hospital. The department, during period of study, had four pathologists, four resident doctors, and three histo-technicians.

Preanalytic phase commences with biopsy taken by the surgeon, including laboratory accessioning of the specimen, surgical cut-up (grossing) by the resident doctor, and tissue processing into slides by the histo-technicians. These usually take about 2days (longer for biopsies from outside).

The analytic phase commences when the resident doctor receives the slides. He/she then screens them and reviews them with the consultant pathologist the following morning. The analytic phase ends with

editing of signed-out reports. The duration for this is variable and most often the most contentious.

- Day 1: receiving biopsy specimen, Grossing and fixation.
- Day 2: Taking sections and processing
- Day 3: Block making and cutting
  Dewaxing
  Staining
  Mounting
- Day 4: Reporting and dispatching report

Thus, application of quality assurance systems within our department is a priority, using many quality indicators including for example turnaround time. The accuracy of diagnosis and providing timely complete reports is one of the main quality indicators in surgical pathology [6].

Turnaround time is considered the key daily quality performance evaluation element due to several reasons: firstly, it can be assessed easily with laboratory information systems; secondly, it has a strong economic impact on cost effectiveness; and thirdly, it is part of the equation of physician satisfaction indicators [1, 6, 7].

Objectives

- To identify the causes of delay in turnaround time in a histopathology laboratory.

METHOD AND MATERIALS

- 3000 specimens processed over a 10-month period in the histopathology laboratory of tertiary care hospital were included in our study.
- From these, mean turnaround time was calculated and causes of delay were identified.
- To identify the causes of delay a register was maintained which includes date on which biopsy was received, date of reporting and date of dispatching report and reason of delay if it took more than four working days.
- **Further classifying factors of delay**.
- Reporting with ancillary additional studies (27cases)
- Additional sections (114 cases) for
- To further study case
- Sections taken for further expert opinion
- Inappropriate block cutting
- **Reprocessing** (129 cases) because of :-
- Technical issues
- When some sections remain soft even after processing first time
- Block cutting
- **Deep sections**(144 cases) were taken for:-
- Thin sections
- Serial sections
- Staining issues
- **History** (390 cases)
- Causes for delay due to history
- Incomplete specimen description and incomplete information on form(294 cases)
- Case related history from treating consultant (96 cases)

RESULTS

Turnaround time for 73.2% cases was within four working days. The delays in timeliness of report generation were due mainly to tissue processing-related factors (4.3%), history of patient (13%), additional and deep sections (3.8+4.8%) and ancillary additional studies (0.9%).

Table-1: Results of this study

	BIOPSY TAT	**% OF CASES**
1	WITHIN 4 DAYS	73.2%(2196 CASES)
2	MORE THAN 4 DAYS	26.8%(804 CASES)
SR NO	**CAUSES OF DELAY**	**% OF CASES**
1	HISTORY OF PATIENT	13%
2	DEEP SECTIONS	4.8%
3	REPROCESSING	4.3%
4	ADDITIONAL SECTIONS	3.8%
5	ANCILLARY ADDITIONAL STUDIES	0.9%

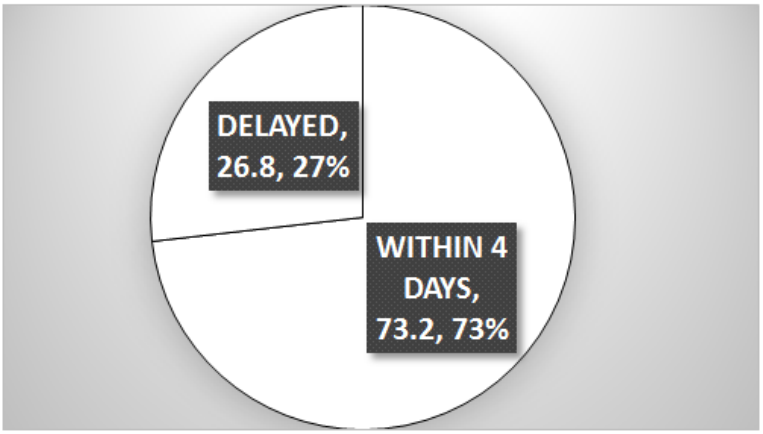

Fig-1: Result displayed with pie-chart

Table-2: Conclusion of study

Sr. No	CAUSES OF DELAY	% OF CASES
1	HISTORY OF PATIENT	48.5%
2	DEEP SECTIONS	17.91%
3	REPROCESSING	16.05%
4	ADDITIONAL SECTIONS	14.8%
5	ANCILLARY ADDITIONAL STUDIES	3.36%

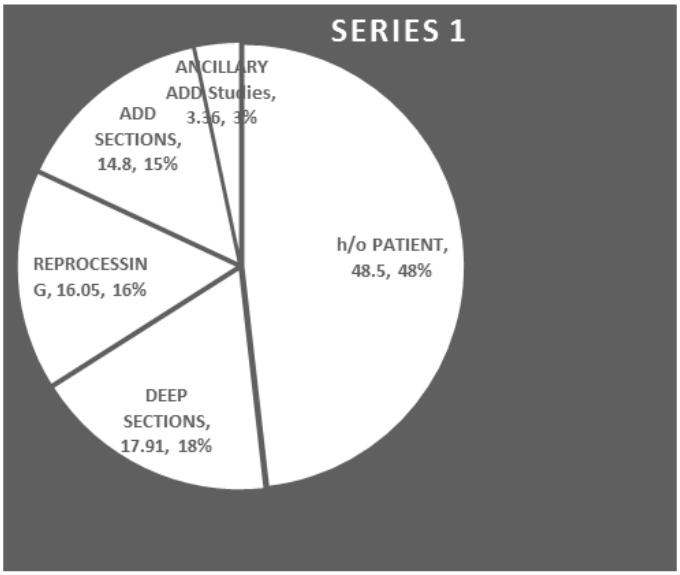

Fig-2: Pie-chart showing various causes of delay

DISCUSSION

Timely anatomical pathology reports are one of the most important tools physicians use to adequately manage the quality and safety of patient care [2, 5].

Hence, verifying pathology reports in an appropriate time frame helps health care practitioners with diagnosing patients in a timely fashion, which will lead to an effective treatment plan [3].

Table-3: Comparision of study

	MY STUDY	AMERICAN JOURNAL, ATLANTA USA	NIGERIAN JOURNAL, KANO TEACHING HOSPITAL
Turn Around Time	4 days	2 days	3.6days
% of cases reported	73.2%	77%	86.7%
		23% within 3 days	

In our study turnaround time for biopsy is 4 days, in study of Atlanta turnaround time is 2 days and in kano teaching hospital, Nigeria it is 3.6days.

We can reduce our turnaround time and increase number of reports reported within 4 days by working on factors delaying it [5].

Mainly history of patient i.e by getting maximum information on biopsy requisition form from clinicians and other by increasing clinical and pathological correlation with clinicians.

Table-4: Comparing with other study

Sr. No	CAUSES OF DELAY	MY STUDY	NIGERIAN STUDY
1	HISTORY OF PATIENT	48.5%	21.4%
2	DEEP SECTIONS	17.91%	15%
3	REPROCESSING	16.05%	28.6%
4	ADDITIONAL SECTIONS	14.8%	27.9%
5	ANCILLARY ADDITIONAL STUDIES	3.36%	7.1%

CONCLUSION

Biopsy reports were delayed mainly due to history of the patient (48.5%), deep sections (17.91%), reprocessing (16.05%), additional sections (14.8%) and ancillary additional studies (3.36%)

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