

Original Article

COVID-19 Pandemic and Nationwide Lockdown: How it Influenced Histo-cytopathology Practice?

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ABSTRACT

Introduction: The 2019 novel coronavirus global pandemic compelled nationwide lockdown in Nepal with attendance of only urgent consultations and surgeries. This study aims to assess the volume, diagnostic categories, and age distribution of cases received in a histo-cytopathology laboratory so that laboratories can be prepared, to cope with a probable surge of COVID-19 or similar incidence in Nepal.

Materials and Methods: A retrospective descriptive study was performed in the Pathology Department, Patan Academy of Health Sciences during the first four weeks of nationwide lockdown from March 24 to April 24, 2020. The current data was compared with that of March 24 to April 24, 2019.

Results: The volume of histopathology specimens was reduced by one-fifth and cytological samples by one-seventh. In histopathology, non-neoplastic lesions were 269 and 65, benign lesions 48 and 1, and malignancy 27 and 6 cases in the corresponding period of the previous year and COVID-19 lockdown period respectively. Appendix, product of conception, placenta, and tubal ectopic pregnancy constituted a major bulk of histopathology cases. The percentage of malignant cases reported in histopathology, as well as cytology, increased during the COVID-19 pandemic. The mean age of patients was 37 years during the COVID-19 lockdown and 41 years in the previous year.

Conclusions: Despite the reduction in the overall volume of histo-cytopathology samples, a higher rate of malignancy was recorded. This emphasizes the necessity of continuing histo-cytopathology services and delivering timely diagnosis even during such a contagion crisis so that oncological patients are not deprived of appropriate management.

Keywords: COVID-19; Histo-cytopathology; Laboratory

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INTRODUCTION

The 2019 novel coronavirus (COVID-19) was first reported from Wuhan, China in December 2019 and traveled relentlessly worldwide.¹ On January 30, 2020, the World Health Organization (WHO) designated COVID-19 outbreak as “public health emergency of international concern”.² In Nepal, the first positive case of COVID-19 was confirmed on January 13 in a 32 years male student who had returned from Wuhan.³ With the rampant spread and increasing fatality, it was declared a “global pandemic”

on March 11 by WHO.⁴ Considering the risk due to rising figures in neighboring countries China and India, a nationwide lockdown was imposed on March 24 in an attempt to curb further transmission and is continuing till date.⁵ As per the instructions from Ministry of Health and Nepal Medical council, all non-urgent consultations and surgeries were halted in hospitals across the country including ours.^{5,6}

Despite preventive measures, the number of new cases is on the progressive rise. According to the situation report by The Government of Nepal, the Ministry of Health and Population, as of May 12, 18964 samples were tested by Reverse transcriptase-polymerase chain reaction method and 191 cases were confirmed.⁷ COVID-19 pandemic has impacted lives, socially, emotionally, and financially. Accordingly, our day-to-day practice of Pathology and health care services in entirety has changed. The closure of non-urgent health services with a consequent reduction in the volume of laboratory samples and the need to protect staff has to lead to an adjustment of working pattern.

This study aims to assess the volume, diagnostic categories, and age distribution of cases received in the histo-cytopathology laboratory during the first four weeks of nationwide lockdown and compares this data with a parallel period of the previous year. The study will provide an insight to laboratories to be prepared accordingly, to cope with a probable surge of COVID-19 or similar incidence in Nepal in the future.

MATERIALS AND METHODS

This is a retrospective descriptive hospital-based study performed in the Department of Pathology at Patan Academy of Health Sciences, Lalitpur, Nepal. The study period was the first four weeks of nationwide lockdown in Nepal from March 24 to April 24, 2020. Ethical clearance was received. All the histopathology and cytology cases reported during this duration were reviewed. All the relevant data were retrieved from the archived reports from the laboratory database and entered and coded in an excel sheet. The data variables were laboratory number, age, gender, type of specimen, anatomical site, and diagnosis. The total number of histopathology samples irrespective of specimen type, as well as cytology samples constituting Pap smear, Fine needle aspiration cytology (FNAC), and body fluids, were recorded. The distribution of diagnostic categories for various samples was documented. The current data of the COVID-19 lockdown period was compared with that of March 24 to April 24, 2019, which was the corresponding period with regular working days of the previous year. Analysis of the data was performed using SPSS version 17.0. The variables were summarized using mean, percentage, and range, and the data was represented with tables and figures.

RESULTS

During the first four weeks of COVID-19 nationwide lockdown, we received 73 histopathology specimens and 24 cytological samples. In the corresponding period during regular working days of the previous year, 342 histopathology specimens (fig. 1) and 166 cytological samples were received. Amongst the cytological samples, Pap smear decreased from 95 to 3 cases, FNAC dropped from 49 to 8 cases and body fluids reduced from 22 to 13 cases. (fig. 2)

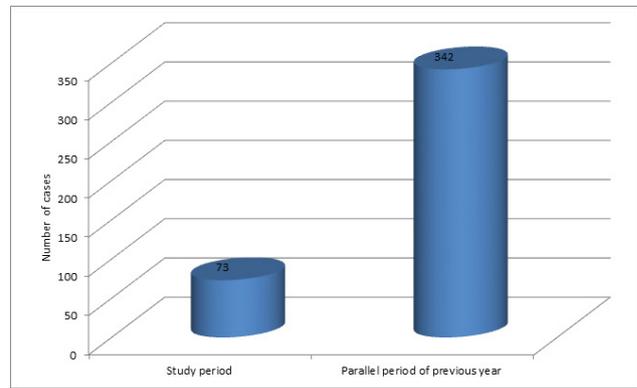


Figure 1: Comparison of the volume of histopathological specimens

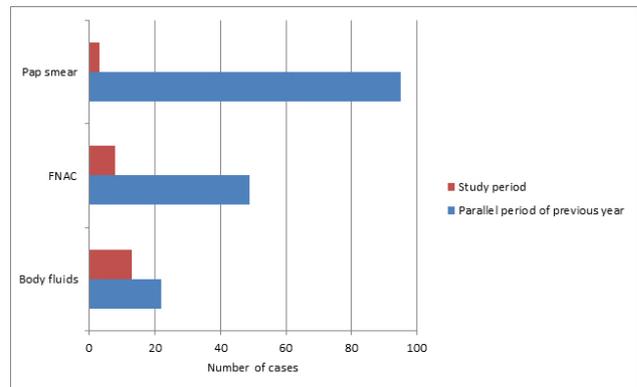


Figure 2: Comparison of the volume of cytological samples

In the diagnostic category of histopathology, non-neoplastic lesions were 269 and 65 cases, benign lesions were 48 and 1 case and malignancy 27 and 6 cases in the corresponding period of the previous year and COVID-19 lockdown phase respectively. There was one case of dysplasia in both periods. (fig. 3) Appendix, product of conception, placenta, and fallopian tube for ectopic pregnancy constituted major bulk of the cases.

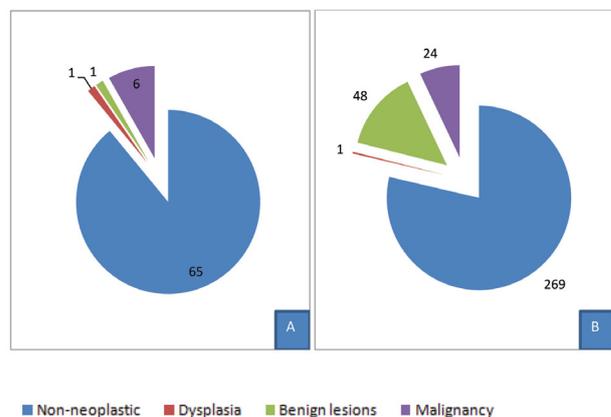


Figure 3: Distribution of the diagnostic category of histopathology cases (A: study period B: corresponding period, previous year)

The percentage of malignant cases reported in histopathology increased slightly during the current COVID-19 pandemic, 8.2% versus 7.3% in the parallel period of the previous year. Malignant cases were as follows: Two subtotal gastrectomies (poorly cohesive carcinoma and adenocarcinoma), excisional biopsy of skin (basal cell carcinoma), hemiglossectomy (squamous cell carcinoma), TURBT (infiltrating urothelial carcinoma) and nephrectomy (invasive papillary urothelial carcinoma of the ureter).

For the cytological samples, overall, the percentage of malignancy diagnosed during the pandemic was almost three times more compared to regular days of the parallel period of the previous year (12.5% versus 4.2%). The malignant cases were papillary carcinoma of the thyroid, metastatic adenocarcinoma in the supraclavicular lymph node, and carcinoma of the gall bladder, all diagnosed via FNAC. (Table. 1)

Table 1: Distribution of the diagnostic category of cytology cases

Specimen	Diagnostic category	COVID-19 period	Parallel period, previous year
Pap smear	Negative for intraepithelial lesion and malignancy	3 (12.5%)	87 (52.5%)
	Unsatisfactory	0 (0%)	8 (4.8%)
FNAC	Inadequate for definitive opinion	0 (0%)	5 (3%)
	Negative for malignancy	2 (8.3%)	0 (0%)
	Non-neoplastic lesion	3 (12.5%)	28 (16.8%)
	Benign lesion	0 (0%)	9 (5.4%)
	Malignancy	3 (12.5%)	7 (4.2%)
Fluid	Negative for malignancy	13 (54.2%)	22 (13.3%)
Total		24	166

The age range of patients during COVID-19 lockdown was 7-89 years with a mean of 37 years and maximum cases were noted in 30-39 years followed by 20-29 years age group. In the parallel period of the previous year age ranged from 3-92 years with a mean of 41 years and maximum cases were noted in 40-49 years followed by 30-39 years age group.

DISCUSSION

The ongoing COVID-19 pandemic has lead to unprecedented strain in the health sector of Nepal. Attempt to control the surge of an outbreak and protect health care providers whilst continuing the management of urgent and essential health services has been a challenge to our fragile health care system.

During the first four weeks of COVID-19 nationwide lockdown, the volume of both histopathology and cytological samples dropped markedly. The histopathology specimens were reduced by one-fifth and cytological samples by one-seventh in comparison to regular working days of the corresponding period

in the previous year. This can prove helpful in speculating the amount of workload that we can anticipate in such a contagion crisis and provide guidance to manage human resources accordingly. This reduction was expected because the imposed lockdown and decision to attend only urgent consultations and surgeries limited the number of patients visiting the hospital with a consequent decrement in samples received at the histopathology laboratory. Amongst the cytological samples, the most significant curtailment of Pap smears stands to reason as it is a screening test. This finding is consistent with that of Vigliar et al who found that relatively fewer cytological samples were processed during COVID-19 lockdown in Italy. In particular, statistically significant differences were observed in Pap smears (n=216, 35.1% versus n=18, 19.1%; p value=0.003), urine (n=85, 13.8% versus n=24, 25.5%; p value=0.005) and effusions (n=23, 3.7% versus n=14, 14.9%; p<0.001).⁸

Amidst the overwhelming COVID-19 catastrophe in Italy, patients were triaged in FNAC clinic into low and higher oncological risk as stated in a study by Vigliar et al. FNAC was postponed for the low-risk group and performed for the higher risk group. They reported more breasts and lymph nodes and a lesser number of thyroid aspirates.⁸ As the COVID-19 figures in Nepal during the study period constituting earlier weeks of nationwide lockdown was substantially low, FNAC was carried out as usual. However, we need to modify our practice by triaging patients, specifying procedural days, and using strict personal protective equipment in case of a possible surge in our country.

Elective procedures were halted and only emergency surgeries were carried out resulting in appendix, product of conception, placenta, and fallopian tube for ectopic pregnancy constituting the major bulk of histopathological specimens. However, it is to be noted that, in both the histopathology as well as cytological cases, despite the reduction in number, the percentage of malignant cases showed an increment when compared to the data of the previous year. This could be attributed to the fact that patients with suspected malignancy were prioritized, investigated, and managed even during this unprecedented pandemic phase in our hospital. Similar to our study, Vigliar et al also noted a higher rate of cytological malignancy during the COVID-19 pandemic and mentioned the continuance of providing service to potential oncological patients while postponing cytological screening activities as the possible reason behind this relative increment.⁸ The relatively higher rate of recorded malignancy emphasizes the necessity of continuing histo-cytopathology services and delivering timely diagnosis even during such a contagion crisis while following biosafety guidelines^{9,10} so that oncological patients are not deprived of appropriate management.

CONCLUSIONS

Despite the reduction in the overall volume of histo-cytopathology samples, a higher rate of malignancy was recorded during the first four weeks of the nationwide lockdown of the COVID-19 pandemic. This emphasizes the necessity of continuing histo-cytopathology services and delivering timely diagnosis even during such a contagion crisis so that oncological patients are not deprived of appropriate management.

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