Janaki Medical College Journal of Medical Sciences (2024); Vol.12 (1):65-70

JMCJMS

Research Article

Cytological Findings of Fine Needle Aspiration Cytology in Diagnosing Causes of Cervical Lymphadenopathy in Patients Attending Health Care Facilities of Janakpur, Nepal

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ABSTRACT

Background & Objectives: Fine Needle Aspiration Cytology (FNAC) is a minimally invasive and inexpensive procedure that produces a rapid result. As cervical lymphadenopathies are common clinical findings with varied causes, FNAC may have an extremely important role in the diagnosis of various underlying clinical condition.

Materials and Methods: A prospective multicentric study was conducted from September 2021 to June 2023 at Janakpur, Nepal. A total of 60 cases were included in the study. The procedure was performed in the cervical lymph node with a 10 ml syringe and 23 gauze needle. The obtained material was spread on the slides and stained with leishman stain and Papanicoloau (PAP) stain. Acid Fast Bacilli (AFB) stain was done for suspected cases of M. tuberculosis infection.

Results: The diagnosis based on FNAC procedure were categorized as reactive lymphadenitis (21 cases, 35%), tuberculous lymphadenitis (14 cases, 23.33%), granulomatous lymphadenitis (8 cases, 13.33%), suppurative lymphadentitis (7 cases, 11.66%) and positive for malignancy (3 cases, 5%). The most common diagnosis in the current

study of cervical lymphadenopathy was reactive lymphadenitis followed by tuberculous lymphadenitis.

Conclusion: FNAC is a quick and reliable method to find the cause of cervical lymphadenopathy allowing appropriate diagnosis, timely management and further investigation if needed.

Keywords: Cervical lymphadenopathy, Fine needle aspiration cytology, Tuberculosis

INTRODUCTION

Lymphadenopathy is a commonly encountered clinical problem having diverse causes, the commonest being a non-specific reactive hyperplasia [1]. Besides having a reactive hyperplasia as an underlying cause for cervical lymphadenopathy, lymphoma or metastatic malignancy may also be responsible [2]. Infection with M. tuberculosis is also responsible for cervical lymphadenopathy in developing countries [3].

Fine Needle Aspiration Cytology (FNAC) is minimally invasive, simple and rapid diagnostic procedure which can identify the nature of lymphadenopathy, allowing rapid onset of therapy without the need for excisional biopsy in most cases [1,4,5]. Metastatic carcinoma can be identified by FNAC, but due to overlap of cytomorphology in some cases, the precise diagnosis of primary tumor remains obscure [6]. Ancillary techniques, such as immunohistochemistry (IHC) may be needed to support the cytodiagnostic interpretation [7].

Besides architectural pattern, World Health Organization (WHO) lymphoma classification is also based on cellular morphology, phenotype and genotype of malignant lymphoid cells, all of which can be assessed on cytology, thus making FNAC a procedure for accurate diagnosis of malignant lymphoma [8]. To the best of our knowledge, this is the first study done on FNAC of cervical lymphadenopathy in health care facilites of Janakpur, Nepal. Hence, this study was conducted to evaluate the cytological pattern of cervical lymphadenopathies and role of FNAC in the diagnosis of various underlying disorders at Janakpur.

MATERIALS AND METHODS

The current study was a prospective study designed to study the various causes of cervical lymphadenopathy over a period of 1 year and 9 months (September 2021 to June 2023). 60 patients of all age groups of both sexes were included in the study. The FNAC procedure of cervical lymphadenopathy was performed in the pathology procedure room of Janaki Medical College and Teaching Hospital (JMCTH), Janakpur, Kavya Hospital Pvt. Ltd., Janakpur and Capital Diagnostic Private Lab, Janakpur by using 10 ml syringe and 23 gauze needle. The FNAC slides were stained with leishman stain, Papanicoloau (PAP) stain and Ziehl-Neelsen (ZN) stain for Acid- fast bacilli (AFB).

Based on ctyomorphological patterns observed in the aspirated material, the diagnosis were classified as reactive lymphadenitis, tuberculous lymphadenitis, granulomatous lymphadenitis, suppurative lymphadenitis and positive for malignancy with further subcategorization as Hodgkin lymphoma and metastatic deposits of small cell carcinoma and sqamous cell carcinoma. Cytology showing lymphoid cells at various stages of maturation without granuloma, caseous necrosis and atypical cells were reported as reactive lymphadenitis [1].

Smears with granuloma with caseous necrosis and smears with granuloma with positive stain for AFB were reported as tuberculous lymphadenitis. Smears showing granuloma, caseous necrosis and positive stain for AFB were also reported as tuberculous lymphadenitis [1,2].

Smears with granuloma but without caseous necrosis and negative stain for AFB were reported as granulomatous lymphadenitis. Features with necrotic cellular debris and sheets of neutrophils were categorized as suppurative lymphadenitis [2]. Presence of Reed-Sternberg cells was categorized as Hodgkin lymphoma [1]. Metastatic malignancy were reported as small cell carcinoma and squamous cell carcinoma depending on cellular features of malignant cells [1]. Samples with inadequate material even after repeat FNAC (maximum 3 attempts) were categorized as "no opinion possible". The records were collected from computer database.

The data was entered in MS excel and was analyzed using Statistical Package for Social Sciences (SPSS, version 21). Descriptive statistics was used and the results were presented in frequency and percentage and depicted using bar charts. Ethical approval was taken from Institutional Review Committee of Janaki Medical College (Ref. IRC/15/2078-079) before conducting the study.

RESULTS

A total of 60 cases of cervical lymphadenopathy were included where male predominance was observed. There were 32 males (53.33%) and 28 females (46.66%) with a male to female ratio of 1.14:1. (Table 1) The patient age ranged from 1.5 years to 77 years with a mean age of 24.74 (± 17.69).

Table 1: Distribution of cervical lymphadenopathy in male and female (n=60)

Cytological Diagnosis	Male (%)	Female (%)
Reactive lymphadenitis	11 (52.38%)	10 (47.61%)
Tubercular lymphadenitis	7 (50%)	7 (50%)
Granulomatous lymphadenitis	4 (50%)	4 (50%)
Suppurative lymphadenitis	4 (57.14%)	3 (42.85%)
Malignancy	3 (100%)	0
No opinion possible	3(42.85%)	4(57.14%)
Total	32(53.33%)	28 (46.66%)

The most common age group was during the second decade (16 cases, 26.66%). (Chart 1 and Table 2) The most common age group for male patients was during the second decade (10 cases, 16.66%) and for female patients was during the third decade (10 cases, 16.66%). (Chart 1)

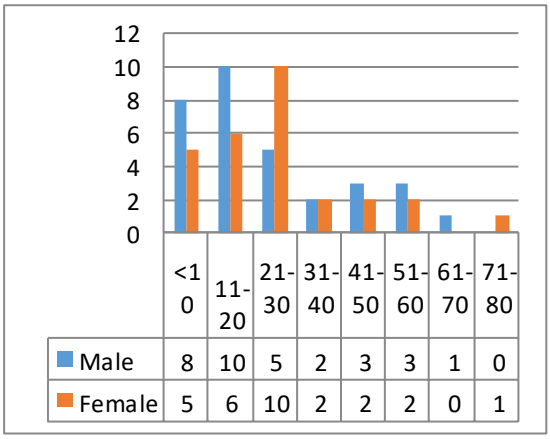

Chart 1: Distribution of patients according to age group in years (n=60)

Reactive lymphadenitis (Figure 1) was the most common diagnosis comprising of 21 cases (35%), followed by tuberculous lymphadenitis (Figure 2, 3 & 4) with 14 cases (23.33%) and granulomatous lymphadenitis

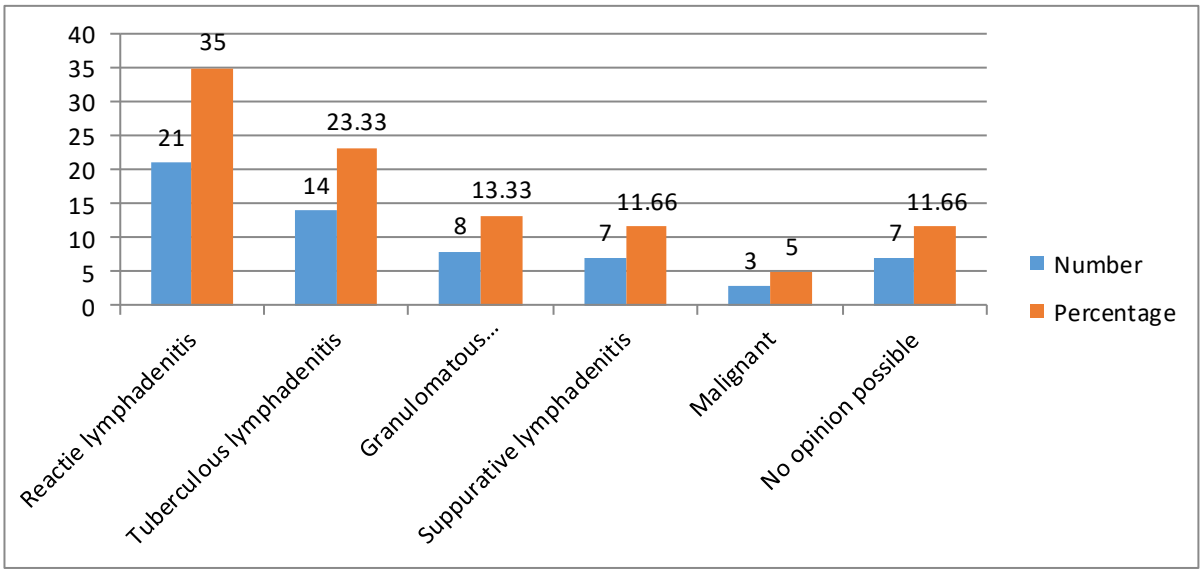

Chart 2: Cytological diagnosis of cervical lymphadenopathy (n=60)

Table 2: Age group wise distribution of FNAC diagnosis (n=60)

Cytological Diagnosis	Age group (years)								
	<10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	Total
Reactive lymphadenitis	9	7	2	1	2	0	0	0	21
Tubercular lymphadenitis	0	2	7	2	1	2	0	0	14
Granulomatous lymphadenitis	0	2	3	1	2	0	0	0	8
Suppurative lymphadenitis	1	2	2	0	0	1	0	1	7
Malignancy	1	0	0	0	0	1	1	0	3
No opinion	2	3	1	0	0	1	0	0	7
Total	13	16	15	4	5	5	1	1	60
Percentage (%)	21.66	26.66	25	6.66	8.33	8.33	1.66	1.66	

with 8 cases (13.33%). 3 cases (5%) of cervical lymphadenopathy were due to malignancy. (Chart 2). The most common age group of cervical lymphadenopathy in our study was during the second decade. Reactive lymphadenitis was most commonly found in the first decade whereas tubercular lymphadenitis and granulomatous lymphadenitis were most common in the third decade. (Table 2). Among the three malignant cases, one case was reported as Hodgkin lymphoma (Figure 5) and the other two cases were reported as metastatic deposit of squamous cell carcinoma and small cell carcinoma (Figure 6 & 7).

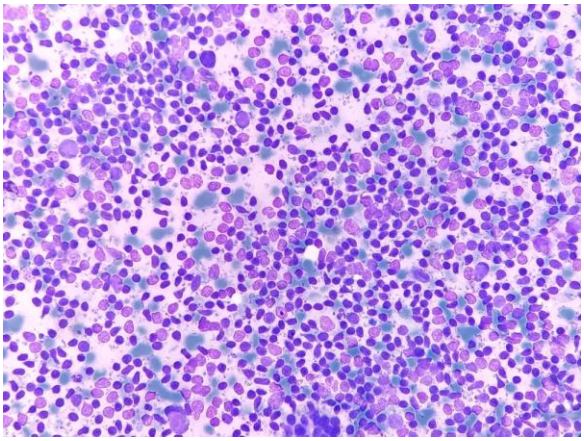

Figure 1: Reactive lymphadenitis showing mature lymphocytes and lymphoid cells at various stages of maturation (Leishman stain 400X)

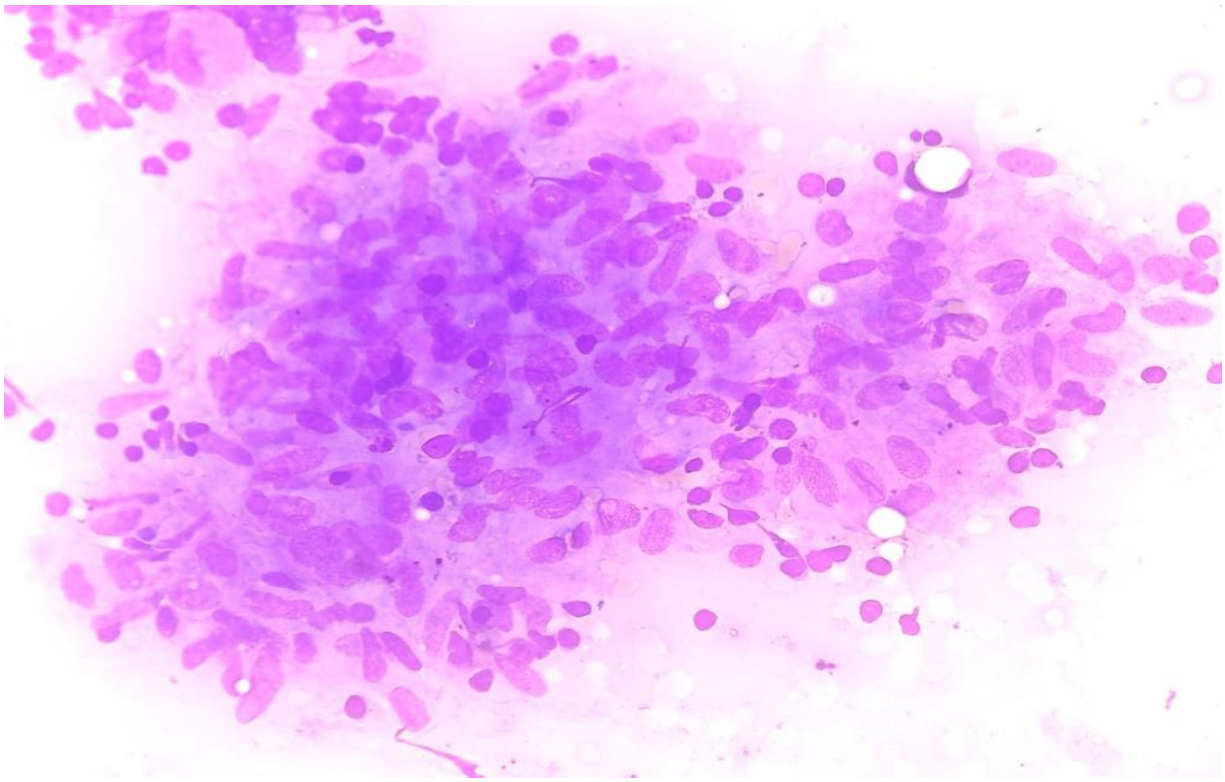

Figure 2: Well-formed epithelioid cell granuloma in a case of tubercular lymphadenitis (Leishman stain 400X)

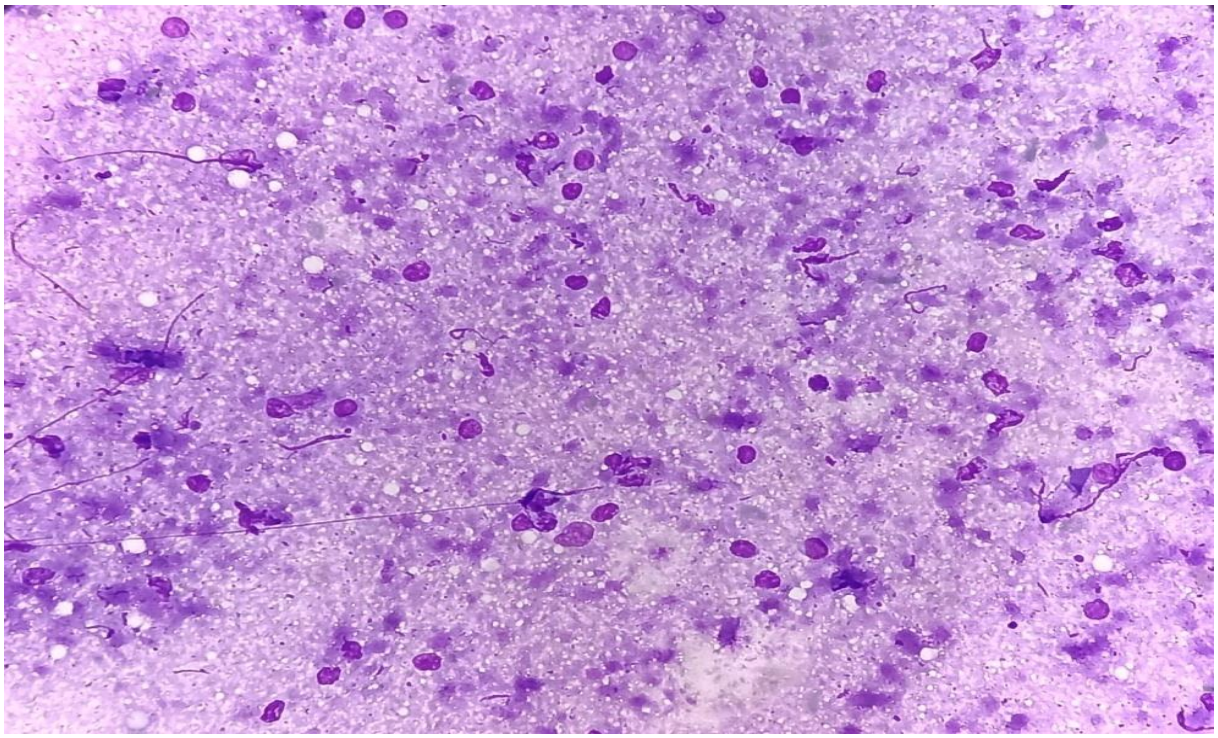

Figure 3: Tubercular lymphadenitis showing caseous necrosis (Leishman stain 400X)

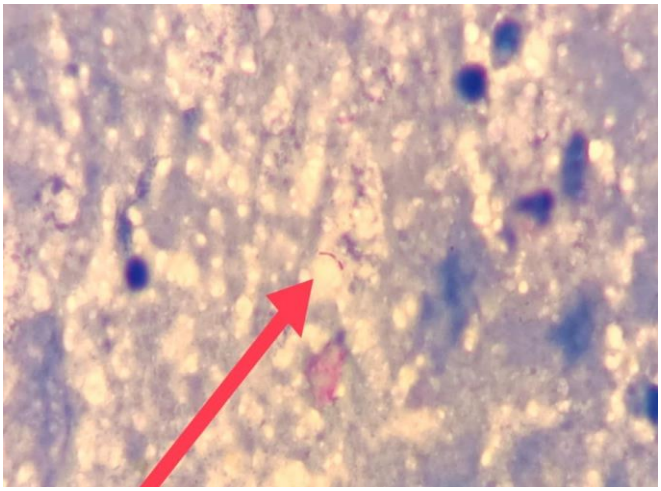

Figure 4: Tubercle bacilli (arrow) in a case of tubercular lymphadenitis (AFB stain 1000X)

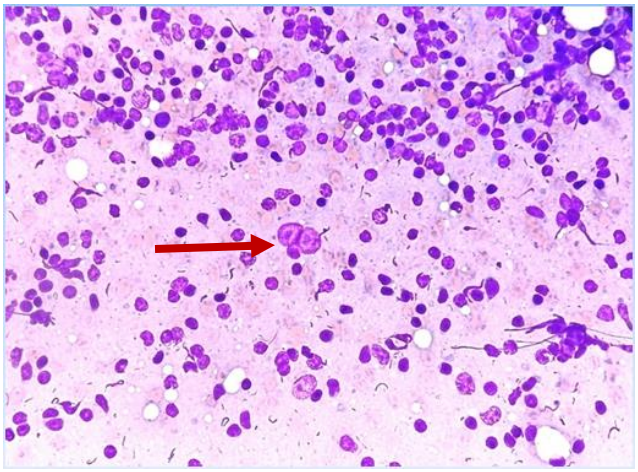

Figure 5: Hodgkin lymphoma showing classical Reed-Sternberg cell (arrow) (Leishman stain 400X)

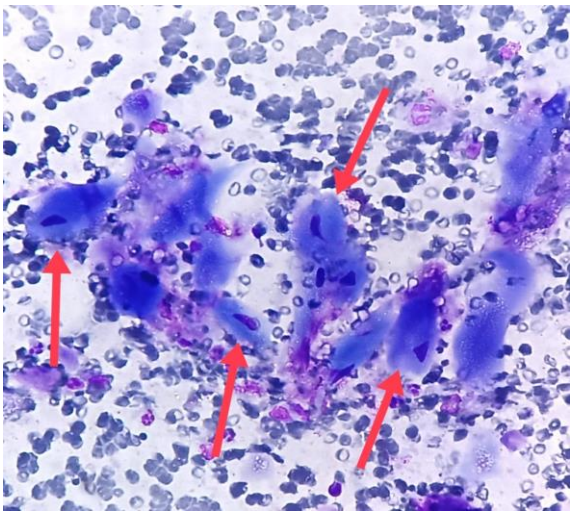

Figure 6: Malignant keratinized epithelial cells (arrow) showing clear blue staining of cytoplasm in a case of metastatic deposit of squamous cell carcinoma (Leishman stain 400X)

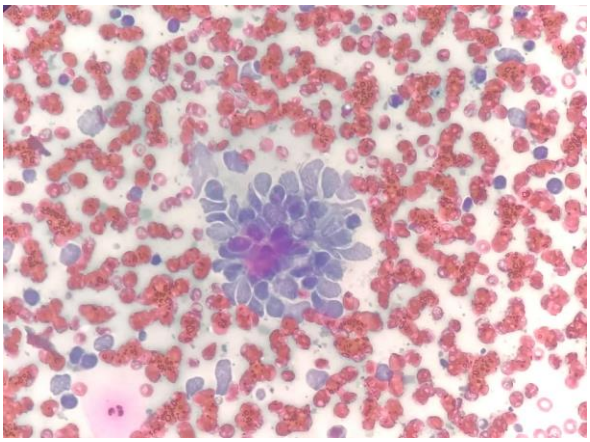

Figure 7: Malignant tumor cells with nuclear indentation and overlapping in a case of metastatic deposit of small cell carcinoma (Papanicolaou stain 400X)

DISCUSSION

FNAC is an important investigation method for diagnosis of cervical lymphadenopathy [9], the etiology of which can be benign or malignant [10]. The cervical lymphadenopathy can be found in patients arising from an early to advanced age [11]. Maximum number of cases in our study was in the age group 11-20 years which is comparable with those of Poudel A et al. [3] and Patel KR et al. [12]. In our study, the commonest diagnosis was reactive lymphadenitis followed by tubercular lymphadenitis which is in consonance with the study done by Shakya G et al. [2], Poudel A et al. [3], Sushama B et al. [13] and Hirachand S et al. [14]. The probability of getting more number of reactive lymphadenitis is possibly because of infections that commonly develops at sites, the lymphatic drainage of which is to cervical lymph nodes.

Tuberculous lymphadenitis was the most common cause of cervical lymphadenopathy according to some study [15,16,17] which is

in contradiction to this study. In this study, the maximum number of tuberculosis was found during the third decade, which is comparable with Pandav AB et al. [9]. In the current study, malignancy had the least number of cases (3 cases, 5%). However, the present study was at variance with the study done by Hafez NH et al. where they found malignancy to be the commonest lesion [5]. The possibility of the higher incidence of tuberculosis cases in our study might be due to high number of cases in this region and due to limited FNAC procedures done at this region prior to this study. The least number of malignant cases could be perhaps because of few number of patients more than 40 years of age, as metastatic malignancy are more common in patients over 40 years of age [1].

Our study has some limitation as sensitivity, specificity and diagnostic accuracy could not be performed for malignant cases and cases with no definite opinion due to the lack of histopathology service (during the study period) in Janakpur.

CONCLUSION

The common cytological diagnosis was reactive lymphadenitis followed by tubercular lymphadenitis. FNAC is simple and rapid diagnostic modality to know the underlying cause of cervical lymphadenopathy. It's use may be extremely helpful in early diagnosis and treatment of tuberculosis without the obvious use of excision biopsy and histopathological examination. Besides these, the FNAC of cervical lymphadenopathy may also be helpful in dealing with metastatic malignancy. Although specific diagnosis may not be possible in some cases, but still FNAC may provide ample information for further management.

ACKNOWLEDGEMENT

We would like to thank Dr. Jitendra Singh for his suggestions and guidance for carrying out this research.

Conflict of interest: None declared

Funding: None

Author's Contribution: Writing of the 1st draft of manuscript, data collection and analysis, reviewed literatures, and final revision- **AKN, AKJ, DP, LC.** All the authors read the final draft of manuscript and approved for publication.

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