Diagnostic accuracy of lymphoma established by fine-needle aspiration cytological biopsy

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Abstract. Based on Globocan data in 2012, it is estimated that about 14,495 Indonesians suffer from lymphoma, both Hodgkin's lymphoma, and non-Hodgkin's lymphoma. Some areas of specialization still doubt the accuracy of cytology diagnosis of fine needle aspiration biopsy. This study is a diagnostic test with a cross sectional analytic design to see how the cytology diagnostic accuracy of fine needle aspiration aspirate in lymphoma. It was in Department of Anatomical Pathology Faculty of Medicine USU, Haji Adam Malik Hospital, Dr.Pirngadi hospital, or private clinic in Medan. Peripheral cytology technique biopsy of fine needle aspiration on lymph node subsequently stained with Giemsa, when the cytology of lymphoma is obtained and confirmed by histopathologic examination. Cytology and histopathologic examination will be tested by Diagnostic Test and assessed for its sensitivity and specificity. The diagnostic of lymphoma cytology provides 93.33% sensitivity and 92.31% specificity when confirmed by histopathological examination. Positive predictive value and negative predictive value of 96.55% and 85.71% respectively. In conclusion, the cytology of fine needle aspiration biopsy is accurate enough to be used as a diagnostic tool, so it is advisable to establish a lymphoma diagnosis to perform a needle aspiration biopsy examination.

1. Introduction

Indonesia is one of the countries with an increasing number of lymphoma patients who need attention. Globocan, 2012 estimates there are about 14,495 new cases of lymphoma in Indonesia.[1] According to the health ministry’s data and information center, the prevalence of lymphoma patients in northern Sumatera is 0.06%.[2]

Nesreen found the accuracy of fine needle aspiration cytology in oral lesions.[3] So it supports previous research in 2011 about the fine needle aspiration biopsy cytology that can be a diagnostic tool. The cytology of fine needle aspiration biopsy on KGB is a long-established technique and is still well used to diagnose abnormalities in KGB according to Frable WJ.[4] John KF mentions the need for histopathological examination after cytology of fine needle aspiration biopsy in lymphoma.[5] Özlem still doubts the results of FNAB.[6] Therefore, research needs to be done to prove the accuracy of fine needle aspiration cytology, either to establish a lymphoma diagnosis or to determine a subtype of lymphoma.

From a study conducted in the Netherlands, found 2556 cases of unexplained lymphadenopathy. About 10% of cases are subspecialty, 3.2% of cases require biopsy and 1.1% is a malignancy. Patients
with age > 40 lymphadenopathies have a 4% malignancy risk compared with patients with age < 40 years of age who have a malignant risk of only 0.4%. Metastatic carcinoma is a more common cause of lymphadenopathy compared with lymphoma.[7]

In general malnutrition or inhibited growth leads to chronic diseases such as tuberculosis, malignancy or immune system disorders. Characteristics of the lymph node and surrounding areas should be noted. The lymph node should be measured for the next comparison. It should be noted whether there is tenderness, redness, warmth on the palpability, can be free to move or cannot be moved, whether there is fluctuation, consistency whether hard or chewy. Enlargement of supraclavicular lymph node of the back of the neck has a greater risk of malignancy than anterior lymph node enlargement. Malignancy, drugs, collagen disease commonly associated with generalized lymph node enlargement. Although atypical lymphoid populations are in most aspiration biopsy specimens of lymphoma cases, the definitive diagnosis of lymphoma remains on lymph node histopathologic examination.[8]

2. Methods
This study is a diagnostic test with across sectional analytic study to see how the cytology diagnostic accuracy of fine needle aspiration aspirate in lymphoma. This research was in Department of Anatomical Pathology Faculty of Medicine USU, Haji Adam Malik Hospital, Dr. Pirngadi hospital or private clinic in Medan and surrounding area for six months.

The number of samples used in this study includes patients with 22 lymphomas. Researchers use the value of P (proportion) = 0.06, d=10%. The significance level used in this study is 0.05 with 95% confidence interval. From the table obtained Za = 1.96.

The collected Samples were by using fine needle aspiration biopsy techniques in patients with enlarged lymph nodes. Aspiration biopsy procedure starting with the skin above the target area is swabbed with an antiseptic solution, after locating the mass for biopsy, using palpation, a special needle of very fine diameter is passed into the mass, the needle may be inserted and withdrawn several times, after the needles are placed into the mass, cells are withdrawn by aspiration with a syringe and spread on a glass slide. The cytological evaluation was performed using Giemsa staining. Cytology is known whether a lymphoma or not, it is from the confirmation of the histopathology examination.

3. Results
The study was performed by histopathologic microscopic examination to confirm the diagnosis of 43 cases of enlarged lymph nodes suspected of lymphoma after a cytology examination of Fine Needle Aspiration Biopsy (FNAB). The results of confirmation of histopathologic examination in the cytology case group with lymphoma and cytologic features without lymphoma showed that 28 cases of 29 cytologic preparations with lymphoma features were tested positive for histopathologic examination, while 12 cases of 14 cytological preparations without lymphoma showed negative results on histopathological examination.

|                | Histopathology of Lymphoma (+) | Histopathology of Lymphoma (-) | Total |
|----------------|-------------------------------|-------------------------------|-------|
| FNAB Lymphoma (+) | 12                             | 1                             | 13    |
| FNAB Lymphoma (-)   | 1                              | 8                             | 9     |
| **Total**           | **13**                         | **9**                         | **22**|

1. Sensitivity : 12 / (12+1) x 100% = 92.31%
2. Specificity : 8 / (8+1) x 100% = 88.89%
3. Accuracy : (12+8) / (12+1+8+1) x 100% = 90.91%

4. Discussion
From these results can be calculated the magnitude of sensitivity, specificity, positive predictive value, negative predictive value, positive likelihood ratio and negative likelihood ratio of cytological diagnostics through lymphoma images confirmed by histopathological examination. It suggests that cytological diagnostics through lymphoma features provides 92.31% sensitivity and 88.89% specificity when confirmed by histopathological examination.

Jason Attard divides the lymph node cytology results into 6 categories: 1, 2, 3, 4, 5, and 6, which conclude that aspiration cytology is very useful and effective.[9] Health Quality Ontario concluded that a fine needle aspiration biopsy cytology examination alone is not sufficient to establish a diagnosis and subclassification of lymphoma, resulting in frequent delays in obtaining a definitive diagnosis.[10] This delay is a bit much to the detriment of lymphoma sufferers.

The results showed considerable sensitivity and specificity with a fine needle aspiration biopsy in diagnosing lymphoma. Furthermore, researchers wanted to know whether the subtype cytology can lead to subtype for Targetting Therapy that distinguishes B cells and Lymphoma T cells through immunohistochemical examination.

5. Conclusion
The examination of fine needle aspiration biopsy in cases of lymphoma confirmed by histopathology examination was 90.91% Accuracy, 92.31% Sensitivity, and 88.89% Specificity. This figure is accurate enough to be used so it is advisable in establishing a lymphoma diagnosis to perform a fine needle aspiration biopsy check.

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