The proliferation index is the most important feature used in benign and malignant diagnosis. It quantifies the percentage of immunopositive nuclei (proliferating cancer cells nuclei) to the whole number of nuclei in selected region with Ki67 stains. The localization of the antigens are visualized with 3,3-Diaminobenzidine and Haematoxylin (DAB&H). The automated quantification of this index is dependent of the architecture of tissue section and type of diseases what results in several such algorithms developed so far [1-4]. In the case of this study the method is adjusted to the samples from the patients diagnosed towards Diffuse Large B-cell Lymphoma (DLBCL), that is very aggressive and can cause high mortality. The samples are mostly biopsies of various lymph nodes, but also skin, tonsils, breast and so on. The lymph node architecture is not always present in samples. The B-cell nuclei are varying in the shape, size and its chromatin is arranged differently: sometimes is uniformly distributed, but mostly is distributed peripherally with dark brown spots on brighter brown background or opposite. The samples of lymph node and affected tissue in various magnification are presented below.

MATERIALS AND METHODS

Methods: The MetpiKi67 (METHOD of Proliferation Index of Ki67) method quantifies proliferating cells' index in samples from Diffuse Large B-cell Lymphoma (DLBCL) patients. This method quantifies the percentage of immunopositive nuclei (proliferating cancer cells nuclei) to the whole number of nuclei in selected region.

It is complicated to segment nuclei with peripheral chromatin than to select nuclei of cell not affected by cancer. The higher the cancer grade the less homogeneous nuclei structures are observed. Their size is increasing and shape is varying. This essentially complicates the identification of individual portions of chromatin and combining them into one object.

RESULTS

11 digital slides from Pathology Department of the Military Institute of Medicine in the form of .mns files (scanned by 3DHistech slide scanners) with diagnosis and proliferation index estimated by experienced pathologist was used to verify proposed method.

DISCUSSION AND CONCLUSIONS

Proposed MetpiKi67 method performs well according to visual inspection but it should be evaluated in comparison to the gold standard. We plan to compare the results with other automatic methods [1-4] and with results of human evaluation based on objects counting.

REFERENCES