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Neutrophil-to-lymphocyte ratio predicts acute appendicitis and distinguishes between complicated and uncomplicated appendicitis: A systematic review and meta-analysis

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Objectives: To investigate whether Neutrophil-to-lymphocyte ratio (NLR) can predict acute appendicitis and whether it can distinguish between uncomplicated and complicated appendicitis.

Methods: A search of electronic information sources was conducted to identify all observational studies reporting NLR in patients with clinical suspicion or confirmed diagnosis of acute appendicitis. We considered two comparisons: 1) appendicitis versus no appendicitis; 2) uncomplicated appendicitis versus complicated appendicitis. NLR was considered as the outcome and the random effects model was used to calculate the pooled effect size. ROC curve analysis was performed to determine cut-off values of NLR for appendicitis and complicated appendicitis. Binary logistic regression models were constructed to investigate whether NLR greater than the calculated cut-off values can predict the presence of appendicitis and complicated appendicitis.

Results: Seventeen studies, enrolling 8,914 patients were included. The NLR was significantly higher in acute appendicitis compared to no appendicitis (MD: 4.94, 95% CI 3.81- 6.06, P<0.00001). The NLR was significantly higher in complicated appendicitis compared to uncomplicated appendicitis (MD: -3.81, 95% CI -4.51 - -3.10, P<0.00001). NLR of 4.7 was cut-off value for diagnosing appendicitis with sensitivity of 88.89 % (95% CI 70.8% - 97.6%) and specificity of 90.91% (95% CI, 58.7% - 99.8%). AUC was 0.96 (95% CI 0.84-1.0, P<0.0001). NLR of 8.8 was cut-off value for complicated appendicitis with sensitivity of 76.92% (95% CI, 46.2%-95.0%) and specificity 100% (95% CI, 75.3%-100%). AUC was 0.91 (95% CI 0.73-0.99, P<0.0001). NLR > 4.7 was predictor of acute appendicitis (OR: 128, 95% CI 10.16- 1538.15, P<0.0001) and, NLR >8.8 was predictor of complicated appendicitis (OR: 43.33, 95% CI 3.90, 481.82, P<0.0001).

Conclusions: NLR is a promising marker that can predict both diagnosis and severity of appendicitis with acceptable sensitivity and specificity. NLR may have implications for patients who do not routinely undergo CT scan (pregnant or paediatric patients) and in settings where "twenty-four seven" access to immediate CT is limited.

Biography

Ketevan Papidze Has graduated from Paediatric faculty of Tbilisi State Medical University (MD) and started her postgraduate education in Paediatric Surgery. During 3 years as junior paediatric surgeon she worked in Orthopaedic surgery, Suppurative Surgery, Neonatal surgery and General Surgery departments of TSMU paediatric clinic. She is currently working in YGC in UK as SHO in General Surgery and has previously worked in Urology, Breast Surgery and Vascular surgery.

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