

Using shock index, pediatric age adjusted (SIPA) to predict prolonged length of stay in perforated appendicitis: a retrospective review

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Introduction: Hospital length of stay (LOS) following admission for appendicitis is difficult to predict. Shock index, pediatric age adjusted (SIPA) has been shown to identify severely injured pediatric trauma patients and predict mortality among children admitted to the intensive care unit (ICU). Our aim was to determine if elevated SIPA at presentation, and time to normalization of SIPA, can identify children with perforated appendicitis and predict hospital LOS.

Methods: We performed a retrospective study of children aged 1-17 years admitted to a single quaternary care center with appendicitis who underwent appendectomy in 2021. Primary outcomes were presence of perforation and hospital LOS. Secondary outcomes were time to tolerate regular diet, total antibiotic duration, and unplanned emergency department (ED) visit within 30 days of discharge. Generalized linear regressions were performed. Covariates included age, sex, fecalith, initial temperature, and time from diagnosis to operating room (OR).

Results: 169 patients were included; 53 (31.4%) had perforated appendicitis. After adjusting for covariates, elevated SIPA at presentation was associated with perforated appendicitis ($p=0.0002$) and longer hospital LOS ($p<0.0001$). A patient presenting with appendicitis and elevated SIPA also had a mean time to tolerate regular diet 4.995 times longer (95% CI: 2.914, 8.918) and a mean antibiotic duration 1.761 times longer (95% CI: 1.383, 2.243) than a patient with normal SIPA. After adjusting for covariates, for each additional hour a patient takes to normalize SIPA, the predicted mean hospital LOS increased by a factor of 1.017 days (95% CI: 1.008, 1.025), the mean time to tolerate regular diet increased by a factor of 1.03 days (95% CI: 1.014, 1.046), the mean antibiotic duration increased by a factor of 1.0014 days (95% CI: 1.006, 1.022), and the odds of experiencing an unplanned ED visit within 30 days of discharge was 1.061 times higher (95% CI: 1.007, 1.119).

Conclusion: In children with appendicitis, elevated SIPA at presentation is associated with perforation. Each additional hour it takes to normalize SIPA is associated with multiple adverse outcomes. These findings support the incorporation of SIPA during triage of patients with appendicitis and when counseling families after surgery.