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Letter to the Editor

Optimizing Clinical Decisions in Fournier's Gangrene Using Prognostic Scoring Models

Fournier Gangreninde Prognostik Puanlama Modellerini Kullanarak Klinik Kararların Optimize Edilmesi

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Dear Editor.

I read with great interest the article prepared by Türk and Aslan named "The Effect of Albumin Level and Neutrophil Lymphocyte Ratio on Mortality and Recovery in Fournier's Gangrene" published in the second issue of the fourth volume of your journal (1). I would like to thank the authors and the editorial group for their diagnostic value study evaluating the ability of albumin and neutrophil lymphocyte ratio to predict mortality in Fornier's gangrene (FG). I would like to expand on the two scoring systems mentioned by the authors in the discussion to contribute to the readers.

FG is a rapidly progressing, life-threatening necrotizing infection that affects the perineum, genitalia, and surrounding tissues. Prompt assessment and management are crucial, as delays in treatment can lead to high mortality rates (2,3). The prognostic role of inflammatory markers has been studied in Fournier's gangrene. Lymphocyte-monocyte ratio (LMR) and red cell distribution width (RDW) have been identified as valuable markers in systemic inflammation (4). Elevated LMR and RDW levels are associated with poor prognosis and increased mortality in conditions such as coronary artery disease and critical illness (5).

Based on the inflammatory process of Fournier's gangrene, prognostic scores have been developed utilizing inflammatory markers. The LRINEC (Laboratory Risk Indicator for Necrotizing Fasciitis) score was developed to differentiate necrotizing infections from other soft tissue infections using initial laboratory parameters. This score is based on C-reactive protein (CRP), white blood cell count, hemoglobin, sodium, creatinine, and glucose levels, with specific points assigned to each parameter. In Fournier's gangrene, the LRINEC score serves as both a diagnostic and prognostic tool. Higher LRINEC scores typically reflect the severity of the disease, the level of systemic inflammation, and the risk of sepsis. Elevated parameters such as CRP and leukocytosis are particularly associated with severe infections and poor outcomes. The score aids in the early diagnosis of Fournier's gangrene and guides patient management. However, the reliability of the LRINEC score in Fournier's gangrene remains debated. Some studies suggest its predictive value for necrotizing infections in this specific patient population is limited. Interpreting the score may be challenging in immunocompromised patients or those with chronic inflammatory conditions (6).

Recently, Yönder et al. developed a novel score based on inflammation and nutrition. Yönder et al. developed the Fournier's Gangrene Mortality Index (FGMI) to predict mortality in Fournier's gangrene patients. This retrospective study included 169 patients treated in Şanlıurfa, Turkey, between 2014 and 2024. FGMI parameters included age, creatinine, albumin, lymphocyte percentage, and neutrophil-to-lymphocyte ratio, with scores ≥5 indicating high mortality risk. Mortality occurred in 11.8% of patients, with significant differences observed in neutrophil and lymphocyte-related markers between survivors and non-survivors. FGMI demonstrated a strong predictive ability for mortality, with an AUC of 0.88, 90% sensitivity, and 70% specificity. In contrast, the LRINEC score lacked effectiveness in mortality prediction. The mentioned study highlights FGMI's utility in early mortality risk assessment (7).

Scoring systems like the FG Severity Index (FGSI) and the Uludağ FG Severity Index (UFGSI) have been developed to aid clinicians in evaluating disease severity, estimating prognosis, and guiding treatment decisions. These tools assess a variety of physiological and biochemical parameters to predict mortality risk, helping physicians to identify patients who may require closer monitoring or more aggressive interventions. Over time, these scoring models have been refined to improve predictive accuracy and support clinical decision-making in managing this challenging condition.

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FGSI is a scoring system used to determine prognosis and predict the risk of mortality in patients with FG. This index helps to evaluate the degree of spread of the disease and the general health status of the patient. FGSI was created by Laor et al. from New York in 1995. They designed that based on Acute Physiology and Chronic Health Evaluation II (APACHE II) score. The data of solely 30 patients with FG treated in 15-year period was evaluated retrospectively. On their data set 13 patients died and 17 patients were survived. An FGSI score above 9 is often associated with a higher risk of mortality, according to data they reported that with a FGSI value of 9 as a threshold, there was a 75% probability of death for scores greater than 9, while a score of 9 or less was associated with a 78% probability of survival. The FGSI is created by measuring the following physiological parameters, with each parameter being given a score between 0 and 4: Body temperature (°C), Heart rate (pulse/minute), Respiratory rate (respiratory rate/minute), Serum sodium level (mmol/L), Serum potassium level (mmol/L), Serum creatinine level (mg/100 ml), Hematocrit (%), White blood cell count (x 103). Each parameter is given a score based on the degree of deviation from normal values (0 is normal, 4 is abnormally high or low). Once the scores are added, the higher the total score, the higher the severity of the disease and the higher the risk of mortality (8). The FGSI helps physicians determine whether they should monitor patients with FG disease more closely and consider aggressive treatment options.

Fifteen years after the work of Laor et al., Yılmazlar et al. from Bursa, developed an updated scoring system named UFGSI, in 2010. The UFGSI is a modified scoring system developed to assess the severity and predict the prognosis of Fournier's gangrene, a rapidly progressing and potentially fatal necrotizing infection of the perineum and genital area. This index builds on previous scoring models, such as the FGSI, by including additional parameters and adjustments to improve predictive accuracy. Yılmazlar et al. recorded their data prospectively for ten years. The dataset in Yılmazlar et al.'s study included 80 patients, comprising 63 survivors and 17 non-survivors. They reported that with a UFGSI threshold value of 9, there was a 94% probability of mortality for patients scoring above 9, while a score of 9 or less was associated with an 81% probability of survival. A secondary analysis was conducted to compare the predictive efficacy of the UFGSI and FGSI scoring systems. Comparison of the area under the curve (AUC) values for mortality prediction demonstrated a statistically significant superiority of the UFGSI (0.947 vs. 0.843). The UFGSI typically evaluates a range of physiological and biochemical parameters, including: Vital signs (e.g., temperature, heart rate, respiratory rate), Blood test values (e.g., hematocrit, white blood cell count, serum sodium, potassium, and creatinine levels), Extent of infection and degree of tissue involvement. Each parameter is scored based on deviations from the normal range, with higher scores indicating more severe physiological derangements. The total score helps clinicians estimate the patient's risk of mortality; a higher score correlates with a higher likelihood of a poor outcome (9). The UFGSI has been particularly valuable for guiding treatment decisions, risk stratification, and resource allocation, as well as aiding in patient counseling and setting expectations for recovery.

In conclusion, scoring systems like the FGSI and UFGSI play a critical role in managing Fournier's gangrene, a severe and rapidly progressing infection. By evaluating key physiological and biochemical parameters, these indices provide a structured approach to assess disease severity and mortality risk. The UFGSI, which builds on the original FGSI with additional parameters, has demonstrated greater predictive accuracy, aiding clinicians in making informed decisions regarding treatment and resource allocation. Higher scores on these indices correlate with increased mortality, underscoring the need for prompt and aggressive management in high-risk patients. Overall, these tools enhance patient outcomes through targeted, risk-adjusted care strategies.

Kind regards

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References

1. Türk H, Arslan E. The Effect of Albumin Level and Neutrophil Lymphocyte Ratio on Mortality and Recovery in Fournier’s Gangrene. IJCMBS. 2024;4(2):76-82.
2. Kar E, Akça HŞ, Özdemir S, et al. Coexistence of Human Immune deficiency Virus, Diabetes Mellitus, Epididymal Cysts, and Fournier’s Gangrene: A Case Report. J. Exp. Clin. Med. 2021;38(4):669-71.
3. Berhuni MS, Yönder H, Elkan H, et al. Uludağ Fournier Gangreni Şiddet İndeksi’nin Fournier Gangreni’nde Prognozu Değerlendirmedeki Katkısı. Uludağ Tıp Derg. 2024;50(2):185-9.
4. Esen Y, Altay Besler S, Büyükaslan H. The Association of Demographic Data and Hematological Parameters with Causes of Death in Patients Following Cardiopulmonary Resuscitation in the Emergency Department. IJCMBS 2024:4(3);144-50.
5. Demir CY, Yuzkat N, Ozsular Y, et al. Fournier Gangrene: Association of Mortality with the Complete Blood Count Parameters. Plast Reconstr Surg. 2018;142(1):68-75.
6. Wong CH, Khin LW, Heng KS, et al. The LRINEC (Laboratory Risk Indicator for Necrotizing Fasciitis) score: a tool for distinguishing necrotizing fasciitis from other soft tissue infections. Critical Care Medicine. 2004;32(7):1535-41.
7. Yönder H, Çelik M, Berhuni MS, et al. Fournier's Gangrene Mortality Index (FGMI): A New Scoring System for Predicting Fournier's Gangrene Mortality. Diagnostics (Basel). 2024;14(23):2732.
8. Laor E, Palmer LS, Tolia BM, et al. Outcome Prediction in Patients with Fournier’s Gangrene. Journal of Urology. 1995 ;154(1):89–92.
9. Yılmazlar T, Ozturk E, Ozguc H, Ercan I, Vuruskan H, Oktay B. Fournier's gangrene: an analysis of 80 patients and a novel scoring system. Tech Coloproctol. 2010 ;14(3):217-23.