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# Analysis of patients who were consulted from the emergency department to the infectious diseases clinic and evaluation of mortality

**Mustafa Alpaslan[1], Necmi Baykan[2]**

[1]*Nevşehir State Hospital, Department of Emergency, Nevşehir, Türkiye*
[2]*Health Sciences University, Kayseri Health Practice and Research Center, Department of Emergency, Kayseri, Türkiye*

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**Abstract**

This study is the evaluation of patients who are primarily admitted from the emergency department on behalf of the infectious diseases and clinical microbiology clinic and the analysis of mortality. The study was retrospectively conducted by analyzing the patients who were admitted to the infectious diseases clinic from the adult emergency department on of the hospital between 01.01.2023 and 31.12.2023 by consultation. Demographic data of the study (time of application, age, gender, comorbidity burden, etc.) presenting complaints, diagnosis, laboratory value, culture test status, hospitalization time and mortality were analyzed. The data of the surviving and deceased patients were compared. A total of 408 patients were included in the study. Of these, 56.9% were female. The mean age was 73.03 ± 15.32 years. When evaluated by age groups, the highest number of admissions occurred in the 61-80 age range (47.8%, n=195). The most common presenting symptoms were fever (27.2%), deterioration in clinical status (19.4%), and acute abdominal pain (10.8%). Overall, 98 patients died, corresponding to a mortality rate of 24%. The mean age, SI and MSI values, the presence of hypertension as a comorbidity burden, neutrophil/lymphocyte ratio and intensive care hospitalization percentage and hospitalization time were significantly higher in the deceased patients ($p<0.05$). Hemoglobin and thrombsitis levels were significantly higher in deceased patients ($p<0.05$). This study provides a comprehensive multidimensional analysis of patients admitted to the infectious diseases clinic from the emergency department as primary care and the factors affecting mortality. However, the retrospective nature of the study creates some limitations. Future studies with a prospective design and larger sample sizes will evaluate the resistance profiles of culture positive cases to more clearly identify the markers that independently affect mortality.

**Keywords:** Emergency department, infectious diseases, mortality

## Introduction

Emergency departments (EDs) are among the busiest units of hospitals, operating 24 hours a day and receiving patients whose diagnoses and treatment needs are often unclear at the time of presentation [1]. Owing to their broad patient profile and high patient volume, EDs constitute a clinically high risk environment for infectious diseases (ID) [1]. The increasing proportion of elderly individuals, the rising prevalence of chronic diseases, the growing number of immunocompromised patients, and the widespread use of invasive procedures all contribute to a greater burden on ID specialists and significantly influence infection related hospital admissions from the ED [1-5].

In addition to the diagnosis and management of acute and chronic conditions, EDs frequently coordinate care with inpatient services, and many patients are hospitalized following ED evaluation [2,3]. Although several studies have analyzed consultations requested from the ED to specialties such as general surgery, psychiatry, neurosurgery, and pulmonology, research focusing specifically on consultations to ID departments including their characteristics, clinical outcomes, and mortality related determinants remains limited [6-9]. Therefore, existing evidence does not adequately reflect the clinical burden associated with ID consultations within the ED setting.

The unique contribution of the present study to the literature is its multidimensional evaluation of patients who were primarily hospitalized under the ID department following consultation from

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**Corresponding Author:** Mustafa Alpaslan, Nevşehir State Hospital, Department of Emergency, Nevşehir, Türkiye
Email: mustafalpaslan@gmail.com

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the ED. The study provides contemporary, region specific data by jointly analyzing culture requests, antibiotic use, admission units, and factors associated with mortality.

We hypothesized that, among patients consulted to and subsequently hospitalized under the ID service, age, comorbidity burden, initial vital signs, laboratory parameters, and the number of antibiotics used would constitute significant predictors of mortality.

Accordingly, this study aimed to assess the demographic characteristics, clinical findings, treatment processes, and mortality related factors of hospitalized patients who were consulted from the ED to the ID clinic, thereby contributing updated evidence to the literature.

## Material and Methods

### Data Collection and Analysis

This retrospective study was conducted at a secondary level healthcare institution. The analysis included patients who were consulted from the adult ED to the ID clinic between 01 January 2023 and 31 December 2023. During this period, 571 ID consultations were requested from the ED. After excluding patients who were discharged directly from the ED, hospitalized under other clinical departments, or had insufficient data for analysis, 408 patients were included. The study focused exclusively on patients who were hospitalized and followed primarily by the ID ward.

Using the hospital's electronic medical record system, all patients who received an ID consultation within the specified timeframe were identified. Demographic characteristics, presenting complaints, ED vital signs (temperature, heart rate, systolic/diastolic blood pressure), calculated shock index (SI), modified shock index (MSI), age shock index (ASI), final diagnoses, comorbidities, admission unit (ward or intensive care unit (ICU)), culture sampling and results, antibiotic treatments, length of hospitalization, and in hospital mortality were recorded.

### Inclusion and Exclusion Criteria

#### Inclusion criteria

- Patients for whom an ID consultation was requested from the ED within the study period
- Primary hospitalization by the ID specialist (ward or ICU)
- Availability of complete clinical and laboratory data in the electronic record system and patient files

#### Exclusion criteria

- Patients younger than 18 years
- Patients discharged directly from the ED after consultation
- Patients hospitalized under other departments instead of the ID service
- Patients with missing core clinical data or insufficient information to determine mortality outcomes

### Management of Missing Data

During retrospective review, files with missing essential variables including vital signs, laboratory results, admission unit, or mortality status were excluded from the study. For patients with missing or inconsistent values limited to secondary variables, listwise exclusion was not applied; instead, analyses were conducted using available data for each variable.

### Statistical Analysis

The data collected in our study were subjected to statistical analysis using the Statistical Package for Social Sciences (SPSS) program version 21.0 (SPSS Inc., Chicago, IL, United States of America). Continuous variables were represented using either the mean ± standard deviation or the median with interquartile range (median, 1st and 3rd quartiles) depending on the distribution of the data. Categorical variables were represented using frequency and percentage. Normality of the data was assessed using the Kolmogorov-Smirnov test and scatter plots. Differences between groups were assessed using Student's t-test (for normally distributed data) or Mann-Whitney U test (for non-normally distributed data). Chi-square test was used to compare categorical data. The accepted level of statistical significance was set at $p<0.05$.

### Ethics Committee Approval

Prior to the study, the approval of the Nevşehir Hacı Bektaş Veli Universitý Non-Interventional Clinical Research Ethics Committee' (No: 2024/08; Date: 25 July 2024).

## Results

A total of 408 patients were included in the study. Of these, 56.9% were female. The mean age was 73.03 ± 15.32 years. When evaluated by age groups, the highest number of admissions occurred in the 61-80 age range (47.8%, n=195). There was no significant difference in hospitalization rates between males and females across age groups (p=0.227). Monthly distribution analysis showed that hospitalizations were most frequent in January (10.8%) and least frequent in October (6.4%) (Figure 1).

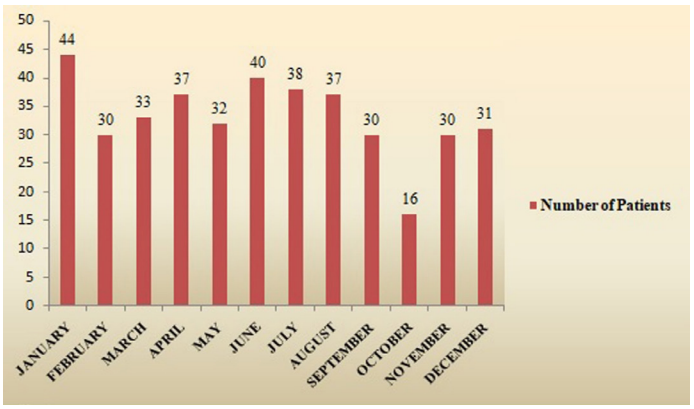


**Figure 1.** Distribution of patient hospitalization numbers by months

The most common presenting symptoms were fever (27.2%), deterioration in clinical status (19.4%), and acute abdominal pain (10.8%). Regarding diagnoses, urinary tract infection (UTI)

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was the leading cause of hospitalization (42.4%), followed by pneumonia (25%) and gastroenteritis (14.2%). Although UTI rates were higher among women (47.4%) than men (31.8%), this difference was not statistically significant ($\chi^2$=10.518, p=0.161). Hypertension (66.4%) and diabetes mellitus (40%) were the most frequent comorbidities.

Regarding the place of admission, 76.2% of patients were hospitalized in the ward and 23.8% in the ICU. The median length of hospital stay was 6.60 days (range: 1-45). Overall, 98 patients died, corresponding to a mortality rate of 24%. The baseline characteristics of the patients are summarized in Table 1.

**Table 1.** General data

| Data | | Number of patients (n) | Percentage (%) / Mean / min-max |
|---|---|---|---|
| **Gender** | **Female** | 232 | 56.9 |
| | **Male** | 176 | 43.1 |
| **Age (average)** | | | 73.03 ± 15.32 |
| **Age ranges** | **20-40** | 18 | 4.4 |
| | **41-60** | 51 | 12.5 |
| | **61-80** | 195 | 47.8 |
| | **81-100** | 142 | 34.8 |
| | **101-120** | 2 | 0.5 |
| **Presenting symptoms** | **Fever** | 111 | 27.2 |
| | **Deterioration in clinical status** | 79 | 19.4 |
| | **Acute abdominal pain** | 44 | 10.8 |
| | **Diarrhea** | 43 | 10.5 |
| | **Shortness of breath** | 43 | 10.5 |
| | **Nausea and vomiting** | 28 | 6.9 |
| | **Weakness and fatigue** | 18 | 4.4 |
| | **Discharge at the wound site** | 15 | 3.7 |
| | **Redness of the skin** | 12 | 2.9 |
| | **Joint pain** | 6 | 1.5 |
| | **Altered mental status** | 5 | 1.2 |
| | **Pain and burning during urination** | 4 | 1 |
| **Diagnosis** | **Urinary tract infection** | 173 | 42.4 |
| | **Pneumonia** | 102 | 25 |
| | **Gastroenteritis** | 58 | 14.2 |
| | **Soft tissue infection*** | 29 | 7.1 |
| | **Cellulite** | 18 | 4.4 |
| | **Intra-abdominal infection*** | 15 | 3.7 |
| | **Catheter and/or prosthesis infection** | 10 | 2.5 |
| | **Meningoencephalitis** | 3 | 0.7 |

*Soft tissue infection: Tenosynovitis. arthritis. skin and subcutaneous infections. etc. *Intra-abdominal infection: Peritonitis. cholecystitis. diverticulitis. pancreatitis. appendicitis. etc. **Data are expressed as mean and 1st and 3rd quartile (minimum and maximum) values

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**Table 1.** General data

| Data | | Number of patients (n) | Percentage (%) / Mean / min-max |
|---|---|---|---|
| Comorbidity burden | Hypertension | 271 | 66.4 |
| | Diabetes mellitus | 163 | 40 |
| | Coronary artery disease | 79 | 19.4 |
| | Chronic obstructive pulmonary disease | 28 | 6.9 |
| | Cerebrovascular disease | 25 | 6.1 |
| Hospitalization | Ward | 311 | 76.2 |
| | Intensive care unit | 97 | 23.8 |
| Culture assessment | No culture taken | 267 | 65.4 |
| | Growth of an infectious agent | 58 | 14.2 |
| | No growth of infectious agents | 83 | 20.3 |
| Culture distribution | Urine | 119 | 29.2 |
| | Blood | 99 | 24.3 |
| | Gaita | 8 | 2 |
| | Phlegm | 3 | 0.7 |
| | Texture | 1 | 0.2 |
| Distribution of drugs used in treatment | Ceftriaxone | 142 | 34.8 |
| | Piperacillin sodium / Tazobactam | 125 | 30.6 |
| | Meropenem | 113 | 27.7 |
| | Moxifloxacin | 109 | 26.7 |
| | Metronidazole | 76 | 18.6 |
| | Vancomycin hydrochloride | 23 | 5.6 |
| | Ciprofloxacin | 18 | 4.4 |
| | Amikacin | 16 | 3.9 |
| | Clarithromycin | 13 | 3.2 |
| Length of hospitalization (days/average) ** | | | 6.60 (3-8) |
| Conclusion | Survival | 310 | 76 |
| | Deceased | 98 | 24 |
| | Total | 408 | 100 |

*Soft tissue infection: Tenosynovitis. arthritis. skin and subcutaneous infections. etc. *Intra-abdominal infection: Peritonitis. cholecystitis. diverticulitis. pancreatitis. appendicitis. etc. **Data are expressed as mean and 1st and 3rd quartile (minimum and maximum) values

Culture samples were obtained from 141 patients (34.5%) before treatment initiation. Urine culture (29.2%) and blood culture (24.3%) constituted the majority of sampling. Among those cultured, 41.3% demonstrated microbial growth. The most frequently administered antibiotics were ceftriaxone (34.8%), piperacillin–tazobactam (30.6%), and meropenem (27.7%) (Table 1). Antibiotic use by diagnostic category is detailed in Table 2.

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**Table 2.** Comparison of diagnosis and antibiotics used

| Diagnosis / Antibiotics | Number of patient (n) / Ratio (%)* | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Ceftriaxone | Piperacillin Sodium / Tazobactam | Meropenem | Moxifloxacin | Metronidazole | Vancomycin Hydrochloride | Ciprofloxacin | Amikacin | Clarithromycin | Total (n/%) |
| **Urinary tract infection** | 64 (37) | 56 (32.4) | 65 (37.6) | 38 (22) | 8 (4.6) | 6 (3.5) | 1 (0.6) | 4 (2.3) | 3 (1.7) | 173 (42.4) |
| **Pneumonia** | 29 (28.4) | 35 (34.3) | 22 (21.6) | 57 (55.9) | 4 (3.9) | 6 (5.9) | 1 (1.0) | 0 (0) | 7 (6.9) | 102 (25) |
| **Gastroenteritis** | 30 (51.7) | 7 (12.1) | 4 (6.9) | 1 (1.7) | 51 (87.9) | 1 (1.7) | 0 (0) | 0 (0) | 3 (5.2) | 58 (14.2) |
| **Soft tissue infection*** | 9 (31) | 9 (31) | 14 (48.3) | 4 (13.8) | 10 (34.5) | 5 (17.2) | 0 (0) | 3 (10.3) | 0 (0) | 29 (7.1) |
| **Cellulite** | 2 (11.1) | 5 (27.8) | 1 (5.6) | 2 (11.1) | 0 (0) | 0 (0) | 1 (5.6) | 9 (50) | 0 (0) | 18 (4.4) |
| **Intra-abdominal infection*** | 4 (26.7) | 7 (46.7) | 3 (20) | 4 (26.7) | 3 (20) | 1 (6.7) | 0 (0) | 0 (0) | 0 (0) | 15 (3.7) |
| **Catheter and/or prosthesis infection** | 3 (30) | 6 (60) | 2 (20) | 2 (20) | 0 (0) | 3 (33.3) | 0 (0) | 0 (0) | 0 (0) | 10 (2.5) |
| **Meningoencephalitis** | 1 (33.3) | 0 (0) | 2 (66.7) | 1 (33.3) | 0 (0) | 1 (33.3) | 0(0) | 0 (0) | 0 (0) | 3 (0.7) |
| **Total** | 142 (34.8) | 125 (30.6) | 113 (27.7) | 109 (26.7) | 76 (18.6) | 23 (5.6) | 18 (4.4) | 16 (3.9) | 13 (3.2) | 408 (100) |
| **Statistical value***** | p= 0.032 | p= 0.006 | p<0.001 | p<0.001 | p<0.001 | p= 0.008 | p<0.001 | p<0.001 | p= 0.263 | |

*The rate given as a percentage is the usage rate of the antibiotic mentioned in the diagnosis. **Soft tissue infection: Tenosynovitis, arthritis, skin and subcutaneous infections. etc. Intra-abdominal infection: Peritonitis, cholecystitis, diverticulitis, pancreatitis, appendicitis. etc. *** Statistical Analysis: Descriptive statistics (frequency and percentage) were used, and the Chi-square test was employed for comparisons of categorical variables between the two groups. Independent groups were compared using the Student's t-test and/or the Mann-Whitney U test. Results are presented as mean ± standard deviation or frequency (percentage), and a p-value<0.05 was considered statistically significant with a 95% confidence interval.

Half of the patients (50%) received a single antibiotic, while 44.9% received two antibiotics, 19% received three, and 2% received four. Single antibiotic therapy was significantly more common among patients hospitalized in the ward (52.7%), whereas dual therapy was significantly more common among ICU patients (48.5%) (p=0.009). When outcomes were analyzed, single antibiotic use was more frequent among survivals (51.6%), whereas in patients who died, the proportions of single (44.9%) and dual antibiotic use (42.9%) were significantly higher (p=0.001).

Comparisons between survivals and deceaseds are presented in Table 3. While gender did not differ significantly between groups, deceaseds were significantly older (p<0.001). At ED presentation, fever (p=0.025) and heart rate (p<0.001) were significantly higher in deceaseds, whereas systolic (p<0.001) and diastolic (p<0.001) blood pressures were significantly lower.

Shock index (SI), modified shock index (MSI), and age shock index (ASI) were calculated. The mean SI, MSI, and ASI values were 1.05 ± 0.33, 1.39 ± 0.44, and 74.15 ± 23.71, respectively. SI and MSI values were significantly higher among deceaseds (p<0.001), whereas ASI did not reach statistical significance (p=0.057).

Mortality was significantly higher among patients presenting with deterioration in clinical status (45.6%), impaired consciousness (40%), and dyspnea (30.2%) (p<0.001). Regarding diagnostic categories, mortality occurred most frequently among patients with UTI (0.9%) and pneumonia (0.8%), with a statistically significant difference between diagnostic groups (p=0.029). Hypertension was significantly more common among deceaseds (p=0.027).

Laboratory analysis revealed that white blood cell count, neutrophil percentage, and neutrophil-to-lymphocyte ratio (NLR) were significantly higher in deceaseds, while hemoglobin and platelet counts were significantly lower (p<0.05 for all). C-reactive protein (CRP) levels did not differ significantly between survivals and deceaseds (p=0.444).

Among deceaseds, 81.4% required ICU care, and mortality differed significantly between ward and ICU admissions (p<0.001). The median length of stay among deceaseds was significantly longer at 12.12 days (range: 3-18) (p<0.001).

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**Table 3.** Comparison of patients ending in survival and deceased

| Data | | General data (n/%/mean/min-max) | Survival (n/%/mean/min-max) | Deceased (n/%/mean/min-max) | Statistical value**** |
|---|---|---|---|---|---|
| **Gender** | **Female** | 232 (56.9) | 184 (79.3) | 48 (20.7) | p=0.080 |
| | **Male** | 176 (43.1) | 126 (71.6) | 50 (28.4) | |
| **Age (average)** | | 73.03±15.32 | 71.25 ± 15.83 | 78.66 ± 12.01 | p<0.001 |
| **Age ranges** | **20-40** | 18 (4.4) | 18 (100) | 0 (0) | p<0.001 |
| | **41-60** | 51 (12.5) | 41 (80.4) | 10 (19.6) | |
| | **61-80** | 195 (47.8) | 161 (82.6) | 34 (17.4) | |
| | **81-100** | 142 (34.8) | 88 (62) | 54 (38) | |
| | **101-120** | 2 (0.5) | 2 (100) | 0 (0) | |
| **Vital signs*** | **Fever (oC)** | 37.53 ± 0.96 | 37.47 ± 0.94 | 37.73 ± 0.99 | p=0.025 |
| | **Heart (beats per minute)** | 104.25 ± 14.28 | 102.82 ± 13.44 | 108.78 ± 15.90 | p<0.001 |
| | **Systolic blood pressure (mm/Hg)** | 103.87 ± 19.04 | 107.09 ± 17.32 | 93.67 ± 20.67 | p<0.001 |
| | **Diastolic blood pressure (mm/Hg)** | 66.36 ± 11.77 | 68.5 ± 10.1 | 59.59 ± 13.98 | p<0.001 |
| | **SI** | 1.05±0.33 | 0.99±0.27 | 1.24±0.40 | p<0.001 |
| | **MSI** | 1.39±0.44 | 1.30±0.36 | 1.64±0.57 | p<0.001 |
| | **ASI** | 74.15±23.71 | 75.44±22.98 | 70.18±25.62 | p=0.057 |
| **Presenting symptoms** | **Fever** | 111 (27.2) | 89 (80.2) | 22 (19.8) | p<0.001 |
| | **Deterioration in clinical status** | 79 (19.4) | 43 (54.4) | 36 (45.6) | |
| | **Acute abdominal pain** | 44 (10.8) | 40 (90.9) | 4 (9.1) | |
| | **Diarrhea** | 43 (10.5) | 37 (86) | 6 (14) | |
| | **Shortness of breath** | 43 (10.5) | 30 (69.8) | 13 (30.2) | |
| | **Nausea and vomiting** | 28 (6.9) | 22 (78.6) | 6 (21.4) | |
| | **Weakness and fatigue** | 18 (4.4) | 13 (72.2) | 5 (27.8) | |
| | **Discharge at the wound site** | 15 (3.7) | 12 (80) | 3 (20) | |
| | **Redness of the skin** | 12 (2.9) | 12 (100) | 0 (0) | |
| | **Joint pain** | 6 (1.5) | 5 (83.3) | 1 (16.7) | |
| | **Altered mental status** | 5 (1.2) | 3 (60) | 2 (40) | |
| | **Pain and burning during urination** | 4 (1) | 4 (100) | 0 (0) | |

*Values of patients' vital signs measured at the time of admission to the ED. SI: shock index (heart rate/systolic blood pressure). MSI: modified shock index (heart rate/mean arterial pressure). ASI: age shock index (Age /SI). **Soft tissue infection: Tenosynovitis, arthritis, skin and subcutaneous infections. etc. **Intra-abdominal infection: Peritonitis, cholecystitis, diverticulitis, pancreatitis, appendicitis. etc. ***The laboratory data of the patients are evaluated at the time of admission to the ED, and the data are stated as the average and the 1st and 3rd quarter (minimum and maximum) values. **** Statistical Analysis: Descriptive statistics (frequency and percentage) were used, and the Chi-square test was employed for comparisons of categorical variables between the two groups. Independent groups were compared using the Student's t-test and/or the Mann-Whitney U test. Results are presented as mean ± standard deviation or frequency (percentage), and a p-value<0.05 was considered statistically significant with a 95% confidence interval

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**Table 3.** Comparison of patients ending in survival and deceased

| Data | | General data (n/%/mean/min-max) | Survival (n/%/mean/min-max) | Deceased (n/%/mean/min-max) | Statistical value**** |
|---|---|---|---|---|---|
| Diagnosis | Urinary tract infection | 173 (42.4) | 135 (78) | 38 (22) | p=0.029 |
| | Pneumonia | 102 (25) | 67 (65.7) | 35 (34.3) | |
| | Gastroenteritis | 58 (14.2) | 49 (84.5) | 9 (15.5) | |
| | Soft tissue infection* | 29 (7.1) | 20 (69) | 9 (31) | |
| | Cellulite | 18 (4.4) | 18 (100) | 0 (0) | |
| | Intra-abdominal infection* | 15 (3.7) | 12 (80) | 3 (20) | |
| | Catheter and/or prosthesis infection | 10 (2.5) | 7 (70) | 3 (30) | |
| | Meningoencephalitis | 3 (0.7) | 2 (66.7) | 1 (33.3) | |
| Comorbidity burden | Hypertension | 271 (66.4) | 201 (74.2) | 70 (25.8) | p=0.027 |
| | Diabetes mellitus | 163 (40) | 118 (72.4) | 45 (27.6) | p=0.193 |
| | Coronary artery disease | 79 (19.4) | 55 (69.6) | 24 (30.4) | p=0.145 |
| | Chronic obstructive pulmonary disease | 28 (6.9) | 20 (71.4) | 8 (28.6) | p=0.646 |
| | Cerebrovascular disease | 25 (6.1) | 18 (72) | 7 (28) | p=0.632 |
| Laboratory values*** | White blood cell ($10^3$/$mm^3$) | 12.96 (8.45-16.10) | 12.20 (8.29- 15.58) | 15.38 (9.25-18.82) | p<0.001 |
| | Neutrophil (%) | 11.1 (6.62-9.52) | 10.4 (6.27-12.89) | 13.33 (7.9-16.81) | p=0.003 |
| | Lymphocyte (%) | 1.42 (0.69-1.63) | 1.48 (0.74-1.67) | 1.22 (1.03-1.44) | p=0.141 |
| | Neutrophil / Neutrophil Ratio (%) | 12.39 (4.83-15.23) | 11.62 ( 4.57-14.52) | 15.27 (6.14-18.38) | p<0.001 |
| | Hemoglobin (g/dL) | 12.2 (10.8-13.8) | 12.35 (10.99-13.8) | 11.72 (9.97-13.52) | p=0.018 |
| | Platelet ($10^3$/$mm^3$) | 265.84 (176-332) | 270.38 (183.75-330.25) | 251.48 (149.5-339) | p=0.013 |
| | C reactive protein (mg/L) | 164.13 (4.83-15.23) | 161.92 (86.15-230.25) | 171.13 (106.5-235.5) | p=0.444 |
| Hospitalization | Ward | 311 (76.2) | 292 (93.9) | 19 (6.1) | p<0.001 |
| | Intensive care unit | 97 (23.8) | 18 (18.6) | 79 (81.4) | |
| Culture assessment | No culture taken | 267 (65.4) | 200 (74.9) | 67 (25.1) | p=0.336 |
| | Growth of an infectious agent | 58 (14.2) | 42 (72.4) | 16 (27.6) | |
| | No growth of infectious agents | 83 (20.3) | 68 (81.9) | 15 (18.1) | |
| Length of Hospitalization (days/average) ** | | 6.60 (3-8) | 4.85 (3-5) | 12.12 (3-18) | p<0.001 |
| Total | | 408 (100) | 310 (76) | 98 (24) | |

*Values of patients' vital signs measured at the time of admission to the ED. SI: shock index (heart rate/systolic blood pressure). MSI: modified shock index (heart rate/mean arterial pressure). ASI: age shock index (Age /SI). **Soft tissue infection: Tenosynovitis, arthritis, skin and subcutaneous infections. etc. **Intra-abdominal infection: Peritonitis, cholecystitis, diverticulitis, pancreatitis, appendicitis. etc. ***The laboratory data of the patients are evaluated at the time of admission to the ED, and the data are stated as the average and the 1st and 3rd quarter (minimum and maximum) values. **** Statistical Analysis: Descriptive statistics (frequency and percentage) were used, and the Chi-square test was employed for comparisons of categorical variables between the two groups. Independent groups were compared using the Student's t-test and/or the Mann-Whitney U test. Results are presented as mean ± standard deviation or frequency (percentage), and a p-value<0.05 was considered statistically significant with a 95% confidence interval

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## Discussion

In recent years, the diversification and increased use of immunosuppressive therapies, the expansion of ICU capacities, and the prolonged hospitalization of patients have contributed to a marked rise in nosocomial infections, substantially increasing the workload of Infectious Diseases and Clinical Microbiology (IDCM) specialists. Inappropriate antibiotic use and rising antimicrobial resistance have not only escalated healthcare costs but have also led to higher morbidity and mortality rates. IDCM specialists play a crucial role in preventing these outcomes [10,11]. In addition to consultations requested from all inpatient departments, consultations originating from the ED for IDCM evaluation hold particular clinical importance. In this study, we aimed to analyze patients who were primarily hospitalized by IDCM specialists following ED consultation.

In the hospital where the present study was conducted, the Percentage of consultations requested from the ED to the IDCM clinic within one year was 6.7%, and 71.4% of these patients were directly admitted and managed by an IDCM specialist. In a comparable study from a tertiary hospital, the consultation rate from the ED to IDCM was 5.6% over a six-month period, and only 10.1% of patients were primarily admitted by the IDCM service [4]. Another study reported that 278 patients (1.4%) out of 19.781 ED admissions were consulted to the IDCM clinic 373 times, and 20 of these patients (97.1%) were admitted primarily by the IDCM team [12]. Fisgin et al. reported that 40.1% of patients consulted to the IDCM clinic were hospitalized and treated by an IDCM specialist [12]. Although consultation rates appear similar across studies, hospitalization rates vary considerably. We attribute the higher hospitalization rate in our study to the hospital's status as a secondary care center, where emergency physicians may preferentially seek IDCM input for cases requiring inpatient treatment.

When evaluating demographic characteristics in our study, the majority of hospitalized patients were female (56.9%). In contrast, two studies reported male predominance at 52.3% and 55%, respectively [1,13]. Since our analysis included only inpatients, and UTI was the most common cause of hospitalization, we believe the greater proportion of female patients reflects the higher prevalence of urinary tract infections among women. In other studies, the inclusion of all IDCM consultations regardless of hospitalization status may explain the higher proportion of male patients. The mean age of hospitalized patients in our study was 73.03 ± 15.32 years. In a study by Temocin evaluating IDCM consultations hospital wide, the mean patient age was 58.5 ± 17.4 years [13].

In our study, the most common reasons for IDCM consultation were fever (27.2%), deterioration in clinical status (19.4%), and acute abdominal pain (10.8%). Consistent with these findings, fever (47.4%) was the most frequent consultation reason in a study analyzing referrals from both inpatient wards and the ED [13]. In another study by Ozsoy et al., the leading consultation indications were lower respiratory tract infections (25.8%), evaluation of fever etiology (25.8%), UTI (11.4%), and animal bites/rabies prophylaxis (10.5%) [4]. In a specialty thesis by Donmez conducted in the ED, the most common diagnoses were soft tissue infections (27%), fever of unknown origin (22%), and UTI (18%) [1]. Fisgin et al. found that in the ED, the most common IDCM consultation reasons were UTI (16.8%), central nervous system infections (15.1%), and soft tissue infections (9.5%) [12]. In our study, the most frequent hospitalization diagnoses were UTI (42.4%), pneumonia (25%), and gastroenteritis (14.2%), which are consistent with existing literature.

Hypertension (66.4%) and diabetes mellitus (40%) were the most common comorbidities among hospitalized patients in our study. In a study by Bozkır et al. investigating UTI in adults, hypertension (42%) and diabetes mellitus (27%) were the most frequent chronic diseases [14]. Similarly, Bakır et al. reported hypertension and diabetes mellitus as the predominant comorbid factors in their patient population [15].

In our mortality analysis, deceased patients were significantly older ($p<0.001$), and hypertension was significantly associated with a fatal course ($p=0.027$). In the research article "Factors Associated with Mortality in Hospitalized Elderly" by Taşar et al., ID were reported as an independent predictor of increased mortality at both one month and one year follow up [16]. The same study showed that hypertension was the leading comorbidity among deceased patients (52.2% at one month, 55.2% at one year) [16]. In our study, a higher NLR at ED presentation was significantly associated with mortality. Prior studies have similarly demonstrated that elevated NLR is strongly associated with mortality in patients with sepsis and bacteremia [17-19]. In a study by Hwang et al., NLR was shown to be an independent predictor of mortality among ED patients with sepsis and septic shock [18]. Age related increases in chronic inflammatory burden, elevated NLR, and underlying sepsis or bacteremia contribute to the heightened mortality risk observed in elderly patients [20]. We also found significantly higher mortality among anemic patients. Several studies have shown that anemia increases mortality risk, particularly in older adults [16,21,22]. In contrast to these findings, although the mean CRP level among deceased patients in our study was high (171.13 mg/L), CRP did not differ significantly between survivals and deceaseds. We believe this may be due to the fact that all patients included in the study were receiving treatment for an active infection.

Sepsis is defined as life threatening organ dysfunction caused by a dysregulated host response to infection. When circulatory dysfunction and metabolic abnormalities accompany this state, septic shock develops, substantially increasing mortality [23]. In critically ill patients with sepsis, the SI calculated as heart rate divided by systolic blood pressure has been shown to be predictive of mortality [24]. Subsequent studies have evaluated MSI and ASI, with both indices demonstrating prognostic value

[24-28]. One study identified SI, MSI, and ASI as significant predictors of mortality in patients with septic shock, reporting that an SI value >1.06 at ICU admission increased mortality risk [28]. In our study, the mean SI, MSI, and ASI values were 1.05 ± 0.33, 1.39 ± 0.44, and 74.15 ± 23.71, respectively. SI and MSI were significantly higher among deceaseds ($p<0.001$), whereas ASI did not reach statistical significance ($p=0.057$).

The culture request rate in our study was relatively low (34.5%), which may be associated with the high workload in the ED, the clinically unstable condition of many patients, and the widespread reliance on empirical antibiotic therapy. This finding suggests that antibiotic selection was predominantly empirical. Although empirical treatment is unavoidable in certain clinical scenarios, low culture rates may negatively influence outcomes by limiting the ability to tailor therapy, delaying antibiotic modification, and preventing the identification of resistance patterns factors that may ultimately affect mortality.

### Limitations of the Study

First, due to the retrospective design, not all clinical variables were documented completely, which limited the scope of certain analyses. The absence of multivariable regression analysis prevented assessment of the independent contributions of factors associated with mortality. This was largely due to missing data in key variables and the potential for multicollinearity among predictors, both of which could compromise the statistical robustness of multivariable modeling. Nevertheless, this remains an important limitation of the study, and future research with a prospective design and larger sample size should incorporate multivariable logistic regression to better identify independent predictors of mortality.

The low rate of culture sampling resulted in antibiotic selection being predominantly empirical and precluded a detailed analysis of antimicrobial resistance patterns based on culture data. The inability to evaluate antibiotic resistance represents a significant limitation, as resistance patterns directly affect treatment success, antibiotic selection strategies, and mortality. Because the number of culture-positive cases was insufficient for meaningful statistical evaluation, resistance trends could not be analyzed. Therefore, future prospective studies should include systematic culture sampling and incorporate resistance profiling of culture-positive isolates to better inform clinical decision making.

## Conclusion

This study also presents several distinctive characteristics compared with existing research. Previous studies have predominantly examined ID consultations from the ED in terms of consultation indications or consultation frequency alone [4,12,13]. In contrast, the present study provides a more comprehensive evaluation by examining not only consultation requests but also the entire clinical course of patients who were subsequently hospitalized primarily under the ID service. This includes an assessment of culture sampling practices, antibiotic utilization, admission units, shock indices, and their relationship with mortality. Notably, the evaluation of physiological markers such as SI, MSI, and YSI in relation to mortality within this specific patient population represents a novel contribution to the literature.

**Ethical Approval**
*Approved by the Nevşehir Haci Bektaş Veli Universitÿ University Non-Interventional Clinical Research Ethics Committee (No: 2024/08; Date: 25 July 2024).*

**Patient Consent**
*Informed consent was waived due to the retrospective design.*

**Conflict of Interest**
*The authors declare no conflict of interest.*

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