Effects of the Beginning of the Academic Year on Hospital Mortality: Is the July Phenomenon Real?

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BACKGROUND

It is suggested that in teaching hospitals, mortality rates are higher in the beginning of the academic year (July phenomenon) than in other months of the year. Differences in mortality rates have been reported according to working hours, weekdays, weekends, and off months. The aim of this study was to search for differences in mortality rates in intensive care units or clinics between working hours and night shift hours, weekends and weekdays, and off months and the beginning of the academic year.

MATERIAL and METHODS

From a total of 65,535 patients hospitalized in clinics and intensive care units of (blinded for peer review) between April 2009 and May 2015, data from 2,210 patients who died due to any cause were retrospectively evaluated. Patients’ exitus frequencies were investigated to find a difference according to working hours/night shift hours, weekends and weekdays, and off months and the beginning of the academic year.

RESULTS

The rate of mortality in months when residents began to work was 47.3% and that in other months was 52.7% (p=0.98). The risk of mortality in months when residents began to work did not show significant difference compared with other months (Odds Ratio (OR): 1.001, 95% CI: 0.919–1.089, p=0.987). The mortality rate was lower in months when residents begin to work than in other months in the departments of surgical sciences (39.8% vs 60.2%, p=0.03), while the rates were similar in the departments of internal sciences and intensive care units.

CONCLUSION

The results of this study did not support literature data suggesting that the risk of mortality is higher in months when new residents begin to work in a training and research hospital.

Keywords: Academic medical centers, mortality, academic year

INTRODUCTION

It has been suggested that the rates of fatal medical errors, morbidity, and mortality increase in the beginning of the academic year when new residents begin their duties in training hospitals and that this may be due to the lack of clinical experience. This transition period has been defined as the “July phenomenon” in the United States of America and “killing August season” in the United Kingdom. Conversely, numerous studies have reported that the rates of mortality and other complications in the beginning of the academic year are not different from those in other months and that the July phenomenon does not reflect reality.

This study aimed to investigate whether the risk of mortality shows an increase in months when new residents begin to work compared to other months.

MATERIAL and METHODS

From a total 65,535 patients hospitalized in clinics and intensive care units of the İstanbul Medeniyet University, Göztepe Training and Research Hospital between April 2009 and May 2015, data from 2,210 patients who died due to any cause were retrospectively evaluated. The study was approved by the ethical committee (Decision no: 2014/0092). Helsinki declaration principles were followed during the study.

Study Design

Patients’ age and gender, date and hour of exitus, clinic/intensive care unit/emergency department in which exitus occurred, and death recordings were examined and recorded. The International Classification of Diseases was used in grouping the causes of hospital admission and death. The rates of mortality were compared between months when new residents began to work (December–February and September–November) and other months (March–June and
October–November). The rate of mortality in the departments of internal sciences and surgical sciences and in intensive care units were further assessed.

Statistical Analysis
Statistical analyses were performed using Statistical Package for the Social Sciences software version 16 (SPSS Inc.; Windows, Chicago, USA). Variables were investigated using visual (histograms and probability plots) and analytical (Kolmogorov–Smirnov/Shapiro–Wilk test) methods to determine whether they were normally distributed. Mortality frequencies in different academic periods [(December–February and September–November) and other months (March–June and October–November)] were assessed using the chi-square test and Fisher's exact test. Descriptive analyses were presented using mean and standard deviation as appropriate. A p-value of less than 0.05 was considered statistically significant.

RESULTS
The number of patients who died due to any reason was 2,210 (1,208 males and 1,002 females, mean age: 54±30 years). The total number of hospitalizations was 31,498, and the number of patients who died was 1,259 (4%) in the departments of internal science, while this number was 241 out of 19,166 (1.3%) in the departments of surgical sciences and 710 out of 14,871 (4.8%) in intensive care units. The rate of mortality in the months when residents began to work was 47.3%, and the rate of mortality in the other months was 52.7% (p=0.98) (Figure 1). The risk of mortality in the months when residents began to work did not show a significant difference compared to the other months (OR: 1.001, 95% CI: 0.919–1.089; p=0.987). Mortality rate was lower in the months when residents began to work than in the other months in the departments of surgical sciences (39.8% vs 60.2%, p=0.03), while the rates were similar in the departments of internal sciences and intensive care units (Table I).

DISCUSSION
The results of this study showed that the rate of mortality in the months when new residents began to work was not significantly higher than in the other months.

It has been suggested that the rates of fatal medical errors, morbidity, and mortality increase in the beginning of the academic year when new residents begin their duties in training hospitals and that this may be due to the lack of clinical experience (1–4). In a study by Phillips et al. (3) all death certificates (n=62,338,584) in the United States of America between 1979 and 2006 were examined, and among 244,388 cases it was found that rate of fatal medical errors was greater by 10% in training hospitals than in those which are not training hospitals in July, which is the beginning of the academic year. In a retrospective observational study comparing the rates of mortality and complications between May and July in patients hospitalized in 98 training hospitals and 1,353 non-training hospitals in the United States of America due to acute myocardial infarction between 2000 and 2008, the rate of mortality was lower in May than in July, which is the beginning of the academic year, and that it was similar in training and non-training hospitals (8). It has been demonstrated in studies conducted in different clinics that the rate of adverse events in patients who have undergone anesthetic procedure, postoperative morbidity and mortality rates in patients hospitalized due to surgical reasons, and preventable or potentially preventable complications in patients hospitalized due to trauma were higher in the beginning of the academic year (4, 9, 10). There are studies showing that the beginning of the academic year is not effective on the rates of mortality and adverse events in training hospitals (II–13). It has been reported in a study evaluating life-saving treatments, diagnostic and therapeutic procedures, and in-hospital outcomes in patients hospitalized with a diagnosis of acute coronary syndrome and decompen-sated heart failure in July–September and November–January periods that there was no significant difference between patients hospitalized in both periods in terms of treatment characteristics and hospital mortality (14). Several retrospective cohort studies have evaluated whether poor clinical outcomes due to a lack of experience, particularly in intensive care units, surgical clinics, and transplantation and trauma centers, are seen more frequently in the beginning of the academic year and reported that mortality rates, hospitalization length, postoperative complications, and infection rates were similar to those observed in the other months of the year (15–18). In contrast, in our study, the rate of mortality in the months when new residents began to work (July–September and December–February) was similar to that in the other months. However, there are some differences affecting the comparison of our results with those from other
studies. The period when new residents begin to work is twice a year Turkey; the beginning of the academic year is in December–January or July–September. Therefore, it is not possible to compare the rate of mortality in a single month with that in other months as in other studies. In our study, the lower rate of mortality in the departments of surgical sciences in the months when new residents began to work than in the other months might be incidental as it might be related to the lower rate of hospitalization in the departments of surgical sciences.

Limitations of the Study
The most important limitations of this study were that the diagnoses of hospitalization and exitus, status of comorbidity, and characteristics of treatment could not be assessed in exitus patients.

CONCLUSION
A similar rate of mortality between the months when new residents began to work and the other months indicates that the beginning of the academic year is not effective on the rate of mortality.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of İstanbul Medeniyet University (Decision no: 2014/0092).

Informed Consent: Informed consent was not received due to the retrospective nature of the study.

Peer-review: Externally peer-reviewed.

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