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Original Article

The Impact of Mortality Conferences on Clinical Processes and Physician Awareness in the Emergency Department: A Single-Center Five-Year Analysis

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ABSTRACT

Objective: Emergency departments (EDs) have high patient volumes and elevated mortality rates. Mortality and Morbidity (M&M) conferences aim to identify causes of death and system deficiencies, thereby improving patient safety. This study retrospectively analyzed ED deaths between 2019 and 2023 and evaluated the impact of M&M conferences initiated in June 2022.

Methods: This single-center, retrospective study included 1,914 patients who died in the ED between January 2019 and December 2023. Demographic data, admission characteristics, triage area, and causes of death were collected. The study period was divided into pre-M&M (January 2019–June 2022) and post-M&M (June 2022–December 2023) phases.

Results: In the pre-M&M period, 1,334 deaths occurred among 1,565,124 ED visits (mortality rate: 8.47 per 10,000 visits). In the post-M&M period, 580 deaths were recorded among 1,306,517 visits (mortality rate: 4.17 per 10,000), corresponding to an approximately 51% relative reduction. The most pronounced decline was observed in the red triage area ($p<0.05$). The mean age of patients was lower in the post-M&M period ($p=0.002$). Non-traumatic deaths decreased, while trauma-related deaths significantly increased ($p<0.001$).

Conclusion: Implementation of structured M&M conferences in the ED was associated with reduced mortality rates and improvements in clinical processes. These conferences provide opportunities for case review, promote continuous learning, and strengthen patient safety culture.

INTRODUCTION

Adverse events caused by medical errors have emerged as a major patient safety concern in modern healthcare. Studies have shown that approximately 10% of hospitalized patients experience adverse events during care, and a substantial proportion of these events are preventable.[1] These findings highlight the importance of quality improvement and patient safety initiatives in healthcare systems and have accelerated the development of systematic approaches to reduce errors.

Morbidity and Mortality (M&M) conferences are among the longstanding initiatives designed to learn from medical errors and improve clinical practice. Historically, M&M conferences are considered to have been introduced in the early 20th century by surgeon Ernest Amory Codman at Massachusetts General Hospital in Boston.[2] Today, M&M conferences remain an integral part of specialty training programs and institutional quality improvement initiatives worldwide.[3]

Emergency departments (EDs) represent one of the most error-prone areas of healthcare due to high patient volumes, time pressure, and elevated mortality rates. In the literature, ED mortality has been reported at approximately 2.6 per 1,000 visits in several series.[4] This underscores the need for systematic evaluation mechanisms to improve

processes and reduce errors, particularly in the management of critically ill patients. Regular M&M conferences in EDs are valuable tools not only for clinical reflection and continuing education but also for strengthening multidisciplinary coordination.[5] These meetings address not only individual clinical errors but also systemic deficiencies, thereby contributing to the reorganization of processes.[6]

Recent studies have demonstrated that structured M&M conferences improve patient outcomes, enhance clinician awareness, and strengthen the culture of safety.[7,8] In surgical settings, comprehensive mortality review programs have been shown to improve observed-to-expected mortality ratios and significantly reduce hospital mortality.[9] In this context, investigating the impact of M&M conferences on clinical processes and mortality rates in the ED represents an important research area for both patient safety and healthcare quality.

MATERIALS AND METHODS

This study was approved by the Kartal Dr. Lütfi Kırdar City Hospital Clinical Research Ethics Committee (No: 2023/514/260/10, Date: 30/10/2023). Owing to the retrospective design, informed consent was waived; the study was conducted in accordance with the principles of the Declaration of Helsinki.

Study Design

This was a single-center, retrospective analytical study conducted in the emergency department of Kartal Dr. Lütfi Kırdar City Hospital , between January 1, 2019, and December 31, 2023. M&M conferences were initiated on June 24, 2022. Accordingly, the study period was divided into pre-M&M (January 2019–June 2022) and post-M&M (June 2022–December 2023) intervals.

Participants

A total of 1,980 ED deaths were identified during the study period. After applying exclusion criteria, 1,914 patients were included in the final analysis. Patients aged ≥18 years who died within the ED were eligible. Cases with missing data or indeterminate cause of death were excluded.

Data Collection

Patient data were retrieved retrospectively from the hospital's electronic medical record system and transferred to Microsoft Excel. Variables included age, sex, time of presentation (daytime/nighttime), triage area (yellow, red, resuscitation), presenting complaint, and cause of death.

Statistical Analysis

Statistical analyses were performed using SPSS version 26.0 (IBM Corp., Armonk, NY). Descriptive statistics were reported as mean ± standard deviation and percentages. The Kolmogorov-Smirnov test was used to assess normality. Student's t-test was used for two-group comparisons; ANOVA or Kruskal-Wallis tests were applied for comparisons involving more than two groups. Categorical variables were analyzed using the chi-square test. A p-value <0.05 was considered statistically significant.

RESULTS

During the five-year study period (January 2019–December 2023), a total of 1,914 deaths were recorded in the emergency department (ED) and included in the analysis. Annual mortality rates increased in 2020 and 2021 during the COVID-19 pandemic, followed by a gradual decline starting in 2022. The lowest mortality rate was observed in 2023 (1.18 per 10,000 visits) (Table 1). After the introduction of structured M&M conferences on June 24, 2022, a marked reduction in overall mortality rates was observed. In the pre-M&M period, 1,334 deaths occurred among 1,565,124 ED visits, corresponding to a mortality rate of 8.47 per 10,000 visits. In the post-M&M period, 580 deaths were recorded among 1,306,517 visits, corresponding to a rate of 4.17 per 10,000 visits. This corresponds to an approximate 51% relative reduction in overall mortality (Table 1). The decline was most pronounced in the red triage area, where mortality rates decreased from 43.3 to 37.7 per 10,000 visits (p<0.05). In the yellow triage area, the absolute number of deaths decreased, although

Table 1. Annual mortality rates (per 10,000 visits)

	2019	2020	2021	2022	2023
Mortality Rates	8.47	6.70	4.17	3.82	1.18

Table 2. Distribution of mortality cases by triage area before and after implementation of M&M conferences

Triage Area	Before (n, %)	After (n, %)	Mortality Rate (per 10,000 visits)	p-value
Red	1213 (91.0%)	540 (93.1%)	43.3 → 37.7	<0.05
Yellow	108 (8.1%)	40 (6.9%)	11.5 → 12.6	
Total	1334 (100%)	580 (100%)	55.0 → 41.0	<0.05

Table 3. Demographic characteristics of mortality cases before and after implementation of M&M conferences

Variable	Before (n=1334)	After (n=580)	Total (n=1914)	p-value
Gender				
Male	722 (54.2%)	306 (52.8%)	1028 (53.7%)	0.571
Female	611 (45.8%)	274 (47.2%)	885 (46.3%)	
Age (Mean±SD)	73.4±15.2	70.1±17.7	72.0±16.4	0.002

Table 4. Distribution of causes of death before and after implementation of M&M conferences

Cause of Death	Before (n, %)	After (n, %)	Total (n, %)	p-value
Acute abdominal pathology	11 (0.8%)	14 (2.7%)	25 (1.4%)	<0.001
Acute coronary syndrome	413 (31.0%)	146 (28.3%)	559 (30.2%)	
Acute cerebrovascular event	29 (2.2%)	18 (3.5%)	47 (2.5%)	
Acute respiratory failure	515 (38.6%)	152 (29.5%)	667 (36.1%)	
Acute vascular causes	39 (2.9%)	28 (5.4%)	67 (3.6%)	
Intoxication	8 (0.6%)	3 (0.6%)	11 (0.6%)	
Multiorgan dysfunction	204 (15.3%)	82 (15.9%)	286 (15.5%)	
Fluid-electrolyte disorder	60 (4.5%)	34 (6.6%)	94 (5.1%)	
Trauma-related death	55 (4.1%)	39 (7.6%)	94 (5.1%)	

the mortality rate showed a slight increase (from 11.5 to 12.6 per 10,000 visits) (Table 2). Male patients accounted for 53.7% of all deaths, with no significant difference between the pre- and post-M&M periods (p=0.571). The mean age of patients decreased from 73.4±15.2 years in the pre-M&M period to 70.1±17.7 years in the post-M&M period (p=0.002) (Table 3). Non-traumatic etiologies such as acute respiratory failure and acute coronary syndrome predominated overall, but their proportion declined following implementation of M&M conferences. Conversely, trauma-related deaths increased significantly in the post-M&M period (p<0.001) (Table 4).

DISCUSSION

This study demonstrated that regular M&M conferences implemented in the ED may contribute to improved quality of care and reduced mortality. Following the introduction of conferences in June 2022, a statistically significant decline in overall mortality was observed. The reduction in non-traumatic deaths suggests that M&M conferences may be effective in reducing preventable mortality.

Our findings are consistent with the literature. For instance, previous studies reported that the vast majority of ED deaths are unpreventable, with only a minority attributable to care deficiencies.[10] However, reductions in non-traumatic deaths observed in our study indicate that structured M&M conferences may influence preventable outcomes. Evidence from intensive care units has also demonstrated that regular M&M conferences reduce adverse events and mortality.[11] Similarly, surgical series have reported improvements in observed-to-expected mortality ratios and reductions in preventable deaths following structured mortality reviews.[9]

Beyond reducing mortality, M&M conferences contribute to professional development, system improvement, and the reinforcement of a safety culture. Systematic reviews have highlighted the positive impact of standardized M&M conferences on clinician engagement and patient safety.[12] Innovative formats, such as "Morbidity, Mortality, and Improvement" conferences, have shown promise in further strengthening safety culture.[13] In emergency medicine, residents perceive M&M conferences as valuable educational tools and emphasize their role in promoting a culture of safety.[14] In internal medicine, participants report learning not only clinical knowledge but also system-level insights and enhanced awareness of patient safety through M&M conferences.[15]

This study has several limitations. As a single-center, retrospective observational study, the observed mortality reductions cannot be attributed solely to M&M conferences. Changes in patient profiles and ED visit volumes following the COVID-19 pandemic may have influenced outcomes. Furthermore, the observational design precludes definitive causal inferences. Differences in the structure and implementation of M&M conferences across institutions may also limit generalizability.

Conclusion

Structured and regularly implemented M&M conferences in the ED were associated with improvements in clinical processes and reductions in non-traumatic mortality. These conferences provide continuous opportunities for

learning and self-reflection, thereby reinforcing a culture of patient safety.

Ethics Committee Approval

The study was approved by the Kartal Dr. Lütfi Kırdar City Hospital Clinical Research Hospital Ethics Committee (Date: 30.10.2023, Decision No: 2023/514/260/10).

Informed Consent

Retrospective study.

Peer-review

Externally peer-reviewed.

Authorship Contributions

Concept: R.I., A.U.S.; Design: R.I., A.U.S., E.Y. ; Supervision: R.A., N.B.; Fundings: R.I., A.U.S.; Materials: R.I.; Data collection &/or processing: R.I.; Analysis and/or interpretation: R.I., A.U.S., E.Y.; Literature search: R.A., A.U.S., N.B.; Writing: R.I., A.U.S., N.B., E.Y., R.A.; Critical review: R.I., A.U.S.

Conflict of Interest

None declared.

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Acil Serviste Mortalite Toplantılarının Klinik Süreçler ve Hekim Farkındalığı Üzerine Etkisi: Tek Merkezli Beş Yıllık Analiz

Amaç: Acil servisler (AS), yüksek hasta hacmi ve artmış mortalite oranları nedeniyle kritik birimlerin başında gelir. Morbidite ve Mortalite (M&M) toplantıları, ölüm nedenlerini ve sistemdeki eksiklikleri belirleyerek hasta güvenliğini artırmayı hedefler. Bu çalışma, 2019–2023 yılları arasında acil serviste gerçekleşen ölümleri geriye dönük olarak analiz etmiş ve Haziran 2022'de başlatılan M&M toplantılarının etkisini değerlendirmiştir.

Gereç ve Yöntem: Tek merkezli, retrospektif tasarıma sahip bu çalışmaya, 1 Ocak 2019-31 Aralık 2023 tarihleri arasında acil serviste hayatını kaybeden 1,914 hasta dahil edildi. Demografik veriler, başvuru özellikleri, triyaj alanı ve ölüm nedenleri kaydedildi. Çalışma dönemi, M&M toplantılarından önceki (Ocak 2019-Haziran 2022) ve sonraki (Haziran 2022-Aralık 2023) dönemler olarak ikiye ayrıldı.

Bulgular: M&M toplantılarından önce 1,565,124 acil servis başvurusunda 1,334 ölüm gerçekleşti (10,000 başvuruda mortalite: 8.47). Toplantılar sonrası 1,306,517 başvuruda 580 ölüm kaydedildi (10,000 başvuruda mortalite: 4.17) ve yaklaşık %51'lik göreceli azalma gözlendi. En belirgin düşüş kırmızı triyaj alanında izlendi ($p<0.05$). Hastaların ortalama yaşı toplantı sonrası dönemde daha düşüktü ($p=0.002$). Travma dışı ölümler azalırken travmaya bağlı ölümler anlamlı olarak arttı ($p<0.001$).

Sonuç: Acil serviste düzenli olarak uygulanan yapılandırılmış M&M toplantıları, mortalite oranlarının azalması ve klinik süreçlerin iyileşmesi ile ilişkili bulunmuştur. Bu toplantılar, olgu değerlendirmesi için fırsat sunar, sürekli öğrenmeyi destekler ve hasta güvenliği kültürünün güçlenmesine katkı sağlar.

Anahtar Sözcükler: Acil servis; hasta güvenliği; morbidite ve mortalite toplantıları; mortalite oranı.