Morbidity and Mortality Evaluation Could Be an Educational Tool to Improve Healthcare Service Delivery

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Background: Few studies have discussed the impact of morbidities and mortalities (MM) on hospital service and the impact on the practice of physicians. Regular hospital morbidity and mortality meetings are educational tools useful for assessing the quality of care and patient safety.

Objective: To evaluate the prevalence of morbidities and mortalities in a tertiary healthcare center.

Setting: King Hamad University Hospital, Bahrain.

Design: A Prospective Study.

Method: All morbidities and mortalities were evaluated from July 2015 to December 2018. All morbidities and mortalities reported directly to the committee, DATIX or through the departmental morbidity and mortality committee were investigated and evaluated. The following data were documented: age, gender, specialty, the cause of morbidity or mortality, patient's outcome, the frequency of occurrence in medical practice, available guidelines to prevent the morbidity or mortality and impact on the physician involved.

Result: One hundred twenty-four morbidity and mortality cases were reviewed from July 2015 to December 2018; sixteen were mortalities. Sixty-eight (54.8%) were females and fifty-six (45.2%) were males. Age ranged between two days and ninety-two years. The majority of cases were between twenty-one and forty years. The highest morbidity and mortality rates were seen in the surgery department, 22 (17.7%), followed by the accident and emergency department, 21 (16.9%). Morbidities were equal in both general surgery and emergency departments, 18 (16.6%), followed by orthopedics, 15 (13.8%) and obstetrics and gynecology, 14 (12.9%). Five physicians were involved in lawsuits which led to aggression against the claimant, denial, depression and frustration towards medical practice.

Conclusion: In our study, we found a trend of increasing morbidity and mortality from 2015 to 2018. In addition, we found that healthcare service was improving because of the evaluation of morbidity and mortality and the establishment of many guidelines governing various procedures.

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Morbidity is defined as unexpected injury or adverse event caused by treatment or surgery by a health care provider. The primary goal of reporting morbidities and mortalities is to enhance patients' safety and care and prevent possible sentinel and adverse events. It is the committee's responsibility to ensure proper and prompt reporting within a well-structured system.

The average human lifespan is increasing; it is approximately 85 years. Therefore, chronic diseases and malignancies might be seen much later in life. Aging may be modified, but as a result, hospital mortalities and morbidities would increase[1]. Preventable mortality could be due to iatrogenesis, human errors, and negligence[2].

Ernest Codman at Massachusetts General Hospital in Boston initiated Morbidity and Mortality Conferences (MMC) in the early 1900s. Codman lost his staff privileges because of that. His effort was resisted by all surgeons for economic reasons. The first recognized MMC was held in 1935. MMC use is now mandated by the Accreditation Council for Graduate Medical Education in human medicine[3].

MMC has great educational value, which could be shared and achieved through presentation and error/s analysis, dissemination of information, and reinforcement of responsibility to provide the best standard of care[4].

Many studies revealed improvements in patient's management, care and safety following MMC presentation. Other studies revealed 50% reduction in malpractice claims[5,6].

In a teaching hospital, mandatory attendance of MMCs is an essential requirement of training. Mandatory MM documentation improves the database and capture of adverse events[7,8].

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In a major medical establishment, the number of adverse events could be overwhelming and beyond the time and resources available for MMCs[3].

Members of the MMC should be familiar with Root Cause Analysis; the objective of which is to identify factors that contribute to adverse events. The common goal is to gain insight into causes, describe the adverse event, then ask "why" it happened; continue to ask "why" until the root cause is identified (may take more or less than five "whys"). It is essential to maintain focus on the process and not the personalities[9,10].

In many countries and several medical institutions, MMC have been embedded within the medical curriculum for medical training[11].

MMC lack a unified internationally agreed format. In addition, hospital adverse events are not necessarily associated with negligence or medical errors. Not following the guidelines, clinical pathway or state-of-art in medical and nursing standards could result in adverse events, which could be preventable[12]. Regular hospital morbidity and mortality meetings are educational tools useful for assessing the quality of care and patient safety.

Tertiary centers receive a large number of patients with varied outcomes in each specialty daily. The growth of the country's population, increase in healthcare, limited resources and rising cost have prompted all teaching hospitals to improve the quality of services provided within the healthcare service by establishing MMC.

Reviewing morbidities and mortalities transparently encourages discussion of patient's management, identifies areas of deficiencies, highlights medico-legal issues, and engages practitioners in teaching activities to adopt a 'no blame' culture for morbidity and mortality reporting[13-17]. The review could indicate that the morbidity or mortality might have been preventable. The objective of the evaluation, in addition to the educational input, is the standardization of healthcare and prevention of a similar future event[18,19].

A medical malpractice lawsuit may significantly impact the life of a physician if challenged with an unanticipated event. The emotional turmoil could be catastrophic if a physician is charged with a malpractice or negligence lawsuit. Over 95% of physicians acknowledge physical or emotional distress during the process of litigation[20]. More than 70% had a negative reaction and reported to have feelings of inner tension, anger, frustration, irritability, depression, adjustment disorder, exacerbation of physical illness, headache, fatigue, gastrointestinal symptoms, alcohol or drug misuse[20-22]. Physicians may also decide to change their career or settle for an early retirement[21]. MMC could contribute to the reduction and prevention of medical malpractice lawsuits significantly.

Miller et al in 1972 showed that educating patients resulted in a lower rate of amputations. Guyatt introduced a new concept known as evidence-based medicine. This approach allowed clinicians to identify, analyze the problem, search for studies and publications relevant to the issue, and to carefully critique the data. Since then, guidelines were established based on evidence to help physicians adhere to good practice and do no harm[23,24].

Vincent et al, in 1998 recommended a framework which considers multiple factors based on systems, resources, internal and external environments to analyze and overcome an adverse event rather than focusing solely on the action of the staff[25]. The framework includes institutional context, organizational and management factors, work environment, team factors, individual factors and patient characteristics, see figure 1 by Ishikawa[25].

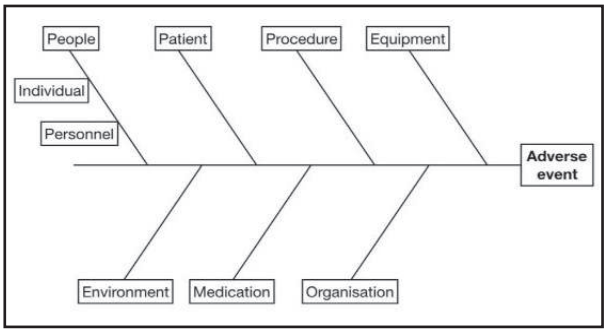

Figure 1: Diagrammatic Representation of Fishbone Analysis

There is currently no published data on the impact of morbidities and mortalities encountered in the Kingdom of Bahrain.

The aim of this study is to evaluate hospital's morbidity and mortality, encourage national institutes to report adverse events to accurately measure clinical performance and formulate strategies to decrease the rate of medical lawsuits.

METHOD

All morbidities and mortalities were evaluated from July 2015 to December 2018. Morbidities and mortalities, patients' related complaints, Datix or through the departmental MMC were investigated and evaluated. Datix is a web-based patient-safety software. After the event is compiled and edited, the committee calls for a small meeting (3-4 available members of MMC) with the physicians involved to be interviewed and to submit their own statement. The MMC will include the comments and physicians statements in the report. The finalized report will be sent to all members involved. All MMC reports are sent to the chief executive officer and chief of medical staff for the implementation of the executive action. Each morbidity case takes at least four to five weeks to be finalized.

In this study, the following data were documented: age, gender, specialty, the cause of morbidity and mortality, patient's outcome, the frequency of occurrence in medical practice, available guidelines to prevent the morbidity or mortality and the impact on the physician involved.

Our MMC members are well-trained in researching and auditing adverse events outcomes. Our MMC would seek senior advice and involve other experts to contribute to the analysis for recommendations and improvement of care.

RESULT

Most of our mortalities and morbidities were preventable. Most of the morbidities and mortalities occurred frequently between 5 pm and 11 pm.

One hundred twenty-four morbidity and mortality cases were included in the study; sixteen were mortalities. All cases were reviewed from July 2015 to December 2018. Sixteen (12.9%) patients were seen in 2015, 17 (13.7%) in 2016 and 40 (32.3%) in 2017 and 51 (41%) in 2018, see figure 1.

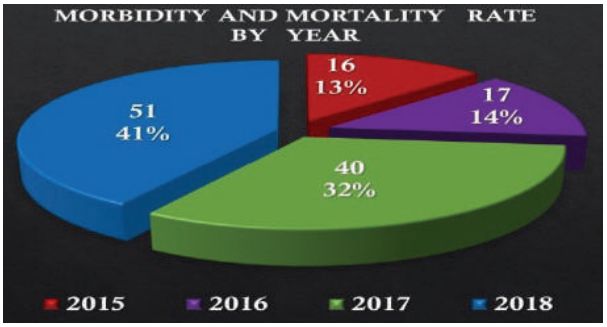

Figure 1: Total Number of Morbidity and Mortality per Year

During the study period, sixty-eight (54.8%) were females and fifty-six (45.2%) were males, there was no significant difference between mortality and morbidity according to gender (P = 0.06), see figure 2.

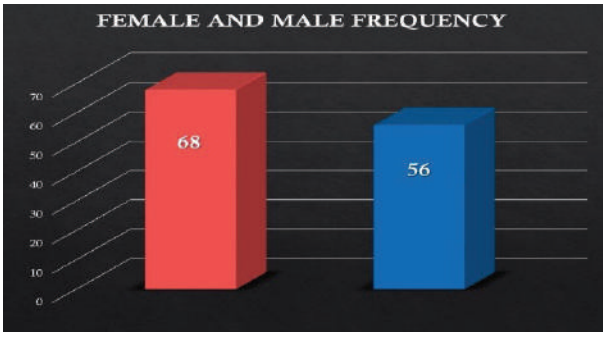

Figure 2: Female and Male Frequency

During the study period, one hundred twenty-four morbidity and mortality cases were reviewed from July 2015 to December 2018; sixteen (13%) cases were mortalities, see figure 3.

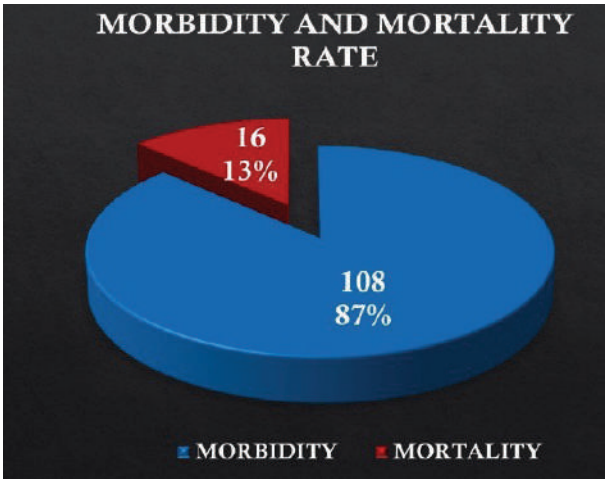

Figure 3: Morbidity and Mortality Rate

During the study period, the highest morbidity and mortality rate was seen from the surgical department, 22 (17.7%), followed by the accident and emergency department, 21 (16.9%). Morbidities were equal in both orthopedic and obstetrics and gynecology, 15 (12%), followed by internal medicine, radiology, ICU, ENT, anesthesia, urology, pediatrics, pediatric surgery, ophthalmology, neurosurgery neurology, NICU, staff health, nuclear medicine, pharmacy and pain clinic. There is significant difference between mortality and morbidity by specialty (P-value = 0.009), see figure 4.

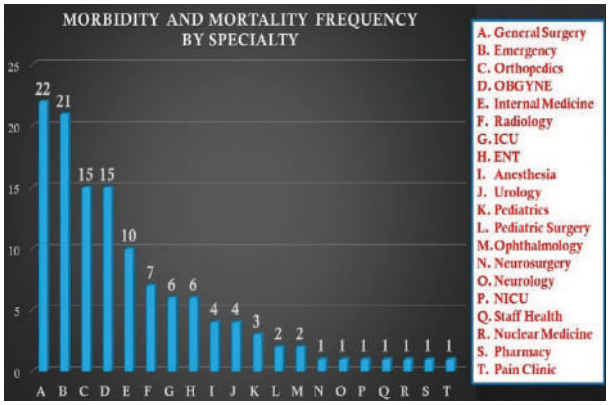

Figure 4: Morbidity and Mortality Frequency by Specialty

The age ranged between two days and ninety-two years. The majority of cases were between 21 and 40 years. The mean age for mortality cases was 52 years (SD =28.2). The mean age for morbidity cases was 43 years (SD = 21.9). There was no significant difference between morbidity and mortality age group (P-value = 0.18), see figure 5.

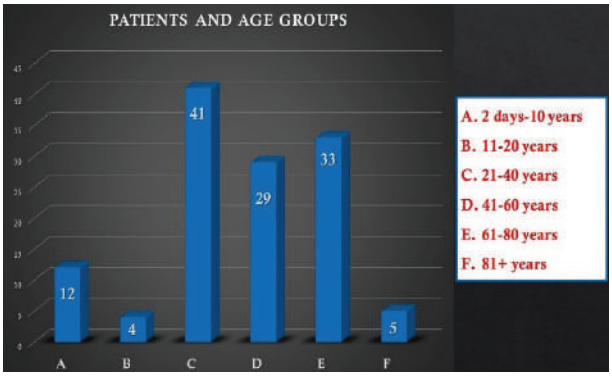

Figure 5: Patients and Age Group

Morbidity rate was equal in general surgery and emergency, 18 (14.5%), followed by orthopedics, 15 (12.1%), obstetrics and gynecology, 14 (11.3%) and internal medicine, 9 (7.3%), see figure 6.

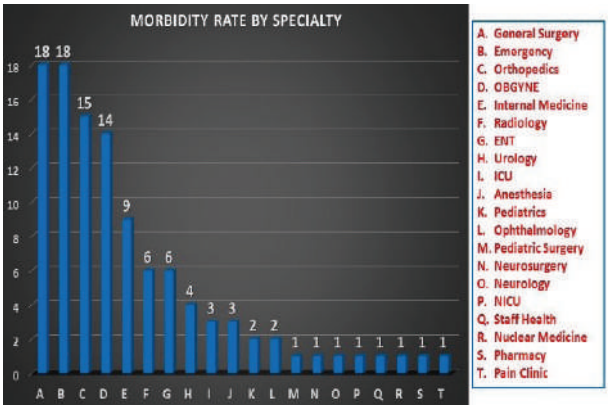

Figure 6: Morbidity Rate by Specialty

Mortality rate was the highest in general surgery, 4 (3.2%) followed by emergency and ICU, 3 (2.4%) see figure 7.

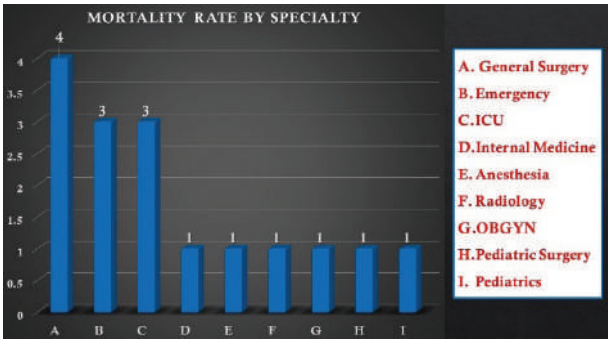

Figure 7: Mortality Rate by Specialty

DISCUSSION

Adverse events are a common occurrence in hospitalized patients. The MMC's objective is to improve patient care. A hospital's objective is to provide continuous best quality healthcare service and improve patient care and safety. Safety is assessed by the ethics/morbidity and mortality committees through incident reports. Aboumatar et al found that at Johns Hopkins, only one of twelve departments was reviewing their adverse events using a standard approach and root cause analysis for major cases only[26]. If a physician is unhappy about the event, it is most likely that it has caused harm to the patient[27]. In our institution, only Obstetrics and Gynecology was holding and reporting a regular MMC. A major source of morbidities is Datix, which is a web-based software that assesses clinical events, claims and complaints. In our institution, only few adverse events are being reported on DATIX[28].

Morbidity and Mortality Root (MMR) cause analysis feedback is of paramount importance for teaching objective and promotion of good practice. The feedback should be linked to the hospital's protocols, policies and managed according to the latest guidelines. Recently, the review process and methods of MMR have been taught to students and integrated into medical school curriculums[27].

Although morbidity and mortality reviews ensure that patients are not harmed due to sub-optimal care, it also compliments other quality assurance services such as sentinel and near-miss events based on investigation and feedbacks. This dynamic analysis of events encourages the organization to routinely report events and integrate it in its teaching system[27].

Six key elements should be applied to guide the process of effective review and its implementation. The elements include clarification of the purpose, review regularly, select cases systematically, seek system issues, share learning and feedback strategy[27].

Our study revealed the occurrence of hospital's morbidities and mortalities among all specialties and age groups. Our evaluation showed that the severity of complications poses greater risks for mortalities and occasionally necessitates disciplinary actions. The total number of reports has increased tremendously throughout the years; this was evident in our study and it is comparable with a total number of complaints published in the annual report by the National Health Regulatory Authority (NHRA)[29,30]. That phenomenon could be attributed to the public awareness of patient's rights and the shift of practice/culture of paternalism in medicine to autonomy; despite this trend, patients would occasionally leave the ultimate decision to the physician[31,32]. Studies regarding physician treatment decision revealed that 23% had withdrawn therapy without the patient's or family's consent, 12% without their knowledge, 3% despite their objections, 75% preferred shared decision with patients, 14% preferred paternalism and 11% preferred an informed approach[31,33]. All our patients consented to the procedure and treatment, but our consent forms are not procedure/treatment specific.

The maximum number of disciplinary actions taken by NHRA was against physicians, which resulted in the suspension of more than 50% of involved physicians, followed by written warning and license suspension[29,30]. In 2015, the majority of complaints were against the private sector, particularly from the department of obstetrics and gynecology and the highest from the emergency department in year 2016[31,32]. Similarly, most lawsuits in many international studies were against obstetrics and gynecology services. In contrast, the majority of morbidities and mortalities, in our study, were from the department of general surgery. Nevertheless, most lawsuits raised within the Kingdom were against general surgery department[32].

Most physicians have immediate emotional distress during the process of litigation, a sense of outrage, shock, or dread[34]. Because physicians are self-critical, they tend to doubt themselves; our advice is to be kind to yourself, diminish the stress and regain emotional equilibrium. Once involved in a lawsuit, the physician should participate in educational activities to improve his/her competence: courses, accreditation activities, teaching, or research[34]. In our study, five physicians were involved in lawsuits which led to aggression against the claimant, denial, depression and frustration towards medical practice/career.

To emphasize the preventive and educational value of MMC, in 2017, we found five cases of venous thrombosis with two pulmonary embolisms, which prompted the hospital to educate physicians and nurses regarding venous thrombosis management according to established and approved guidelines. Since then, not a single case was reported.

The strength of the MMC process was evident when analyzing the gross morbidity and mortality rate following its implementation. A well-structured MMC compared to non-uniformed departmental review grasped more preventable adverse events and morbidities, and result in the reduction of lawsuits[35-37].

Our study had a few limitations. There is no clear system which classifies a morbidity into minor or major, not all morbidities are reported in the Datix system and not all cases discussed in the morbidity and mortality of the department concerned. In addition, some heads of departments believe that the morbidity and mortality committee infringes on their privacy and their "Godlike behavior". Many clinical departments do not hold regular MMC meetings and others do not report their adverse events to the hospital MMC. Therefore, the number of morbidities according to specialties may not necessarily reflect the reality. Furthermore, in this study, we have evaluated all the major morbidities only, as well as their effects. The minor morbidities/incidents are unfortunately still being underreported. Additionally, although we have evaluated the short-term morbidities, the long-term morbidities are unknown and not recorded in the long-term prospective study.

We have recently adopted the Ottawa MMC Model (OM3). Key components of the module include appropriate case selection, structured case analysis, creating and disseminating summaries, developing an administrative pathway for action item and encourage inter-professional and multidisciplinary involvement[38]. During the meetings, one-third of the time is

allocated in describing the case, one-third for analysis and one-third for open discussion and action plan.

The impact of our study is the implementation of a well-structured review of both departmental and hospital's wide MMC; reporting morbidities have become mandatory. The quality department has nominated a facilitator who attends the clinical departmental MMC and reports back to the hospital-wide MMC, which leads to a decrease in biases.

Hospital-wide MMC meetings are held monthly and all physicians, nurses, students and technicians are invited to attend to discuss cases transparently and openly for teaching purposes and no blame culture. In appropriate cases, we strongly recommended to invite other allied health professionals who are actively involved in the patient's care such as clinical pharmacist, social worker, psychologist and nutritionist.

Similar morbidities rarely occurred after it was discussed in the wide hospital MMC meeting. Hence, educating healthcare providers regarding evidence-based medicine, hospital guidelines and utilizing the simulator center and the wet lab lead to decreased unexpected mortalities.

The study has highlighted an important aspect, which indicates that morbidity arises due to a system failure rather than an individual error. The defect could be due to patient factors, lack of technical skills, decreased care level due to work overload and burn out, teamwork failure, improper resident supervision, lack of specialist consultants, administration contributors such as budgeting and absence of pathways and guidelines. Last but not least, external contributors like paramedic services and public health awareness campaigns could well contribute to the prevention of adverse events.

CONCLUSION

In our study, we found a trend of an increased morbidity and mortality rate from 2015 to 2018. Patient service has improved due to the evaluation of morbidities and mortalities and the recommendations of many guidelines governing various procedures.

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Competing Interest: None.

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