ORIGINAL RESEARCH

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A prospective audit of Gynaecological Critical Incidents in the Tshwane Tertiary Hospital Complex

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ABSTRACT

Background: Critical incidents have been reported among the top ten leading causes of morbidity and mortality worldwide. Recently, a renewed focus has been on recognising and identifying critical incidents among gynaecological patients. Accurate reporting and analysis of critical incidents represent a strategy and possible intervention to improve patient safety.

Objectives: The aim of the study was to report the incidence rates and describe the nature of critical incidents among gynaecological hospital admissions at Steve Biko Academic (SBAH) and Kalafong Provincial Tertiary Hospital (KPTH) in Gauteng, South Africa.

Methods: This was a prospective, descriptive analysis of critical incidents among patients admitted to the gynaecology wards at Steve Biko Academic and Kalafong Provincial Tertiary Hospitals from 1 August 2021 to 30 July 2022. During the daily audit meetings, all gynaecological patients who met the criteria of a critical incident were discussed in detail, and a critical incident form was completed for each case. Descriptive analyses were conducted in Stata 15.0® (StataCorp, 4905 Lakeway Drive, College Station, Texas 77845 USA).

Results: There were 3225 patients seen between 1 August 2021 and 31 July 2022. A total of 217 patients met the criteria to be classified as critical incidents, thus giving an overall critical incidence rate of 6.7%. The median age (interquartile range [IQR]) of the patients who suffered critical incidents was 42 (34 – 54) years. The median (IQR) gravidity and parity were 2(1 – 4) and 2(1 – 3), respectively. Over a third, 37% (n = 80), of these patients were HIV positive. Of the 217 patients who met the critical incidents criteria, 78.3% (n = 170) were admitted with the intention of surgical treatment. Most, 54.4% (n = 118) of those patients were elective admissions. The three most prevalent critical incidents were omission of the procedure (46%, n = 107), followed by death (28%, n = 66) and performance of unplanned surgery (12%, n = 27). Lack of theatre time was the most common reason for procedure omission (46%, n = 49). Other reasons, namely lack of blood products (4%, n = 49), SARS-CoV-2 (Covid-19) positive results (3%, n = 7), new HIV diagnosis (2.5%, n = 6), change of management plan (2.5%, n = 6) and patient not fit for anaesthesia (2.5%, n = 6) were the following prevalent causes of omission of procedures.

The most common avoidable factors were in the category of admin factors (71%, n = 75). The most common reason in this category was inadequate theatre time (46%, n = 49).

Conclusion: Critical incidents are a significant cause of morbidity among gynaecology patients at SBAH and KPTH. A substantial proportion of these critical incidents are avoidable.

Keywords: Gynaecology; Critical incidents

INTRODUCTION

Background

Several community-based studies have highlighted that gynaecological morbidity is increasing among middle and low-income countries.[1-3] There has recently been renewed focus on recognising and identifying adverse incidents contributing to gynaecological morbidity.[4-5] Organisational (including administrative or infrastructural) and clinical competencies pertaining to human error have been cited as responsible factors contributing to patient morbidity and mortality.[6]

The Canadian Regulation 965 of the Public Hospitals Act defines a critical incident as "Any unintended incident that occurs when a patient receives treatment in the hospital, that results in death, or serious disability, injury or harm to the patient, and does not result primarily from the patient's underlying medical condition or from a known risk inherent in providing the treatment".[7] Analysis of the literature shows that critical incidents have been studied in surgical, medical and obstetrics disciplines, with a paucity of data pertaining to gynaecology.[2,5]

To further explore underlying issues relating specifically to gynaecological morbidity, a set of critical incident criteria were developed and defined by Lombaard and Pattinson in 2004.[3] These incidents include adverse incidents related to the diagnosis. According to the authors, a critical incident may be defined as "any cause or action that leads to extra morbidity in the patient as well as any intervention that, when it is performed, could lead to serious morbidity or mortality in the gynaecological wards." Their six-month audit revealed an overall critical incident rate of 5% in the emergency admission group compared to 15% in the elective admission group.[3]

Assessment of current clinical practice includes daily morning audits coupled with individual case assessment, review process (identification of condition-specific avoidable and modifiable factors) and, in some units, completion of critical incident data form.[3,8] This process is imperative as audit, feedback and reporting systems remain strategic tools to impact the care of women by healthcare professionals.

Literature review

Global perspective

Several published guidelines exist for the management of pregnant women. These guidelines have been developed gradually and systematically over time with the aim of delivering safe and high-quality care to pregnant women. Critical incidents are increasingly recognised as a source of harm to patients.[4,9] Improving patient safety has become a global priority, and another way to reach this goal is

to systematically report and analyse critical incidents.[10] However, only recently has there been an increased focus on critical incidents in gynaecology. Thus, there is limited published literature on the topic of critical incidents in gynaecology compared to obstetrics practice.[11]

Current literature on gynaecological morbidity studies includes adverse event reporting, amongst other systems.[2] In healthcare, adverse incidents refer to unintended consequences resulting in temporary or permanent disability, death or prolonged hospital stay.[8] Although the incidence of adverse events is higher in surgical compared to medical specialities, there is a paucity of data exploring adverse events and their consequences in Gynaecology.[11-13] Lack of dedicated or underdeveloped auditing is a probable causative factor in some areas.[5]

A systematic review and meta-analysis by Tanaka et al.[2] on the incidence of adverse events, preventability and mortality in gynaecological hospital admissions reported that approximately one in ten gynaecological in-patients suffer at least one adverse event, half of which are preventable.[2] In addition, the incidence of adverse events in gynaecological hospital admissions was 11%, of which 53% was preventable, and the mortality rate was 1%.[2]

It has been shown that the public's confidence in doctors and hospitals has been negatively affected in recent years as a result of critical incidents.[14] Evidence suggests that increased transparency and honest communication with patients after adverse incidents can improve provider-patient relationships.[9,15] To restore and retain the lost confidence, healthcare systems and strategists need to show that effective mechanisms exist to assess and manage critical incidents.[6] A recent review was conducted to summarise the knowledge of healthcare professionals in handling the aftermath of critical incidents and to develop recommendations to reduce their negative impact on patients, their relatives and health professionals.[16] The following recommendations were made to improve the recognition and communication of critical incidents to patients and relatives: (i) drafting clear safety and organisational policies, (ii) adopting a proactive approach to prevent the reoccurrence of critical incidents, (iii) ensuring availability of resources to provide an appropriate response, (iv) thorough analysis of the critical incidents and (v) informing patients and/or family members of critical incidences early.[16]

Globally, studies show that a significant proportion of adverse events are preventable.[8] The Harvard Medical Practice study reported the incidence of adverse events and negligence in hospitalised patients in 51 hospitals in New York and found that 4% of adverse events occurred in hospitalised patients.[17] It was further revealed that 28% of the adverse events were due to negligence, while 14% led to death.[18] In addition, an Australian retrospective study of patient records in 28 hospitals in New South Wales reported an adverse event rate of 17%, and about 56% of those adverse events were preventable.[19] Since July 2010, the Canadian Hospital Board (as per Regulation 965 of the Public Hospitals Act) has been required to establish a system of analysing critical incidents and develop a systematic plan to reduce or avoid the risk of repeat or similar critical incidents.[7]

Monitoring adverse events is important as they can have significant economic impacts on individuals, healthcare providers, and the wider healthcare system. Adverse events may increase healthcare costs due to the need for additional medical treatment, hospitalisation, and rehabilitation services.[20] Patients may require extended hospital stays or additional surgeries, which can significantly increase healthcare costs. Adverse events can also result in lawsuits, which can be costly for healthcare providers and facilities in terms of significant financial settlements, legal fees, and increased malpractice insurance premiums.[14,21] Adverse events can result in lost productivity for patients and healthcare providers. This is because patients may require time off work to recover from medical errors or hospital-acquired infections, while healthcare providers may need to take time off to deal with the aftermath of adverse incidents.[15]

Low- and middle-income country perspective

A study conducted in eight African and Middle east countries in Africa has found an average adverse events rate of 8% across these eight countries.[22] This finding is similar to other studies, with a rate of about 10%.[17, 23] However, the proportion of preventable adverse events was significantly high at 83%.[22] A Kenyan study conducted at a tertiary hospital found that reviewing medical records was more effective than incident reporting (1.4% vs 0.03%) in identifying adverse events, indicating that many incidents are never reported.[24] Arguably, this may result from fear of being held responsible for the occurrence of the adverse event.[9] It could also be due to inadequate staff education on the importance of reporting an adverse event.[25]

South African scenario

A set of gynaecological critical incident criteria, which includes adverse events, have been defined and developed by Pattinson and Lombaard.[3] According to the definition, "a critical incident is defined as any cause or action that leads to extra morbidity in the patient as well as any intervention that when it is performed could lead to serious morbidity or mortality in the gynaecological wards".[3] In accordance with this criterion, a woman may suffer from an adverse event and a critical incident. The authors published a study entitled, "Gynaecological critical incidents: An audit of current gynaecological practice at Kalafong Hospital over a six-month period", which found that the hospital had a critical incident rate of 8%, with the majority related to elective admissions compared to the emergency admission group.

A study on the adverse incidents in Gynaecology at King Edward VIII Hospital, Durban, South Africa, reported an adverse event incidence of 12% of admissions, where 52% were avoidable.[1] The most common type of adverse event was therapeutic mishaps, especially failure to initiate treatment on time. Visceral injuries, bladder injuries, in particular, were the second most common type of critical incidents (3% of major gynaecological surgery).

The criteria set by Pattinson and Lombaard are important in setting up a system to analyse and potentially minimise recurrences of critical events. The use of these criteria to study gynaecological morbidity is more accurate and inclusive and may enable us to differentiate between clinical incidents and infrastructural or organisational factors.

Research on critical incidents can stimulate data-driven decision-making and planning between healthcare providers, politicians, and governmental/non-governmental organisational structures. Critical incidents/incidents form the basis of societies' mistrust of healthcare providers and institutions.[20] To this end, the healthcare system needs to show that effective mechanisms exist for assessing, documenting and managing critical incidents.

RATIONALE OF THE STUDY

This study sought to describe the nature of the critical incidents (e.g., death, intensive care admission, unplanned surgery etc.) and modifiable factors among women admitted for gynaecological care at Steve Biko Academic (SBAH) and Kalafong Provincial Tertiary Hospitals (KPTH). In addition, the authors aimed to determine the overall critical incident rate and the critical incident rate per condition.

MATERIALS AND METHODS

This was a 12-month prospective descriptive audit study, from 1 August 2021 until 31 July 2022. This study was conducted at the Department of Obstetrics and Gynaecology at Steve Biko Academic Hospital and Kalafong Provincial Tertiary Hospital. All elective and emergency gynaecologic admissions patients aged at least 18 years, who met the definition of a critical incident and who were willing and able to provide informed consent were eligible for recruitment into the study. Exclusion criteria included patients seen in the gynaecology outpatient department and not admitted, patients younger than 18 years, and those unwilling and unable to provide consent.

During the daily Obstetrics and Gynaecology audit meetings, all patients who met the criteria of a critical incident pertaining to gynaecology were discussed in detail, and the critical incident form (see Appendix I) was completed for each case after obtaining informed consent. The principal investigator anonymised all identifiable data before capturing the data into an Excel spreadsheet.

Study data was imported from Microsoft Excel to Stata statistical software version 16 (Stata Corp, Texas USA) for analysis. Continuous data were assessed for normality using the Shapiro-Wilk test. Normally distributed continuous data were described as means and standard deviations, whilst non-normal data were described using median and interquartile ranges (IQR). Categorical data were described using frequencies and percentages. A comparison of continuous data was conducted using the Wilcoxon Rank-Sum test. Categorical variables were compared using the Chi-squared or Fischer's exact test if cell size frequency was less than 5. The significance level (p-value) was set at 0.05.

Ethics approval was granted by the Ethics Committee of the Faculty of Health Sciences of the University of Pretoria with reference number 62/2021.

RESULTS

Overall study results

There were 3225 gynaecological admissions between 1 August 2021 and 31 July 2022. A total of 217 patients, 120 from SBAH and 97 from KPTH experienced at least one or more critical incident reports, thus giving an overall critical incidence rate of 6.7%. The critical incident rate of 7.3% for SBAH was not significantly higher than 6.5% for KPTH (p = 0.52).

Characteristics of enrolled participants

Table 1 below illustrates the basic sociodemographic characteristics of patients with critical events. The median (IQR) age of the patients who suffered critical incidents was 42 (34-54) years. The median gravidity (IQR) was 2 (1-4). The median parity (IQR) was 2 (1-3). Slightly more than half of the patients, n = 120 (54%), were admitted at SBAH, with the remainder being admitted at KTPH, n = 97 (46%). Most of these patients, n = 131 (60%), were gynae-oncology patients, followed by general gynaecology, n = 56 (26%), urogynaecology, n = 20 (9%), reproductive gynaecology, n = 8 (4%) and only two (1%) were obstetric patients. Most of the patients were elective admissions, n = 118 (54.4%), with 57 (26.3%) being oncology patients and 42 (19.3%) being emergencies. The main intention for the admission was to conduct surgical treatment, n = 170 (78.3%). A total of 21 (9.7%) and 26 (12%) were admitted for medical and palliative reasons, respectively. Over a third, n = 80 (37%) of the patients were confirmed HIV positive on admission.

Table 1: Sociodemographic characteristics of patients that had critical incidents (n = 217)

Description	Mean (SD) or median (IQR or n (%)
Age years	44.2 (13.8) or 42 (34 – 54)
Hospital of admission (n = 217)	
Steve Biko Academic Hospital	120 (55.3%)
Kalafong Tertiary Provincial Hospital	97 (44.7%)
Unit of admission (n = 217)	
Gynae oncology	131 (60.4%)
General gynaecology	56 (25.8%)
Uro-gynaecology (SBAH)	20 (9.2%)
Reproductive gynaecology (SBAH)	8 (3.7%)
Obstetrics	2 (0.9%)
Type of admission (n = 217)	
Elective	118 (54.4%)
Oncology	57 (26.3%)
Emergency	42 (19.3%)
Treatment intention (n = 217)	
Surgical	170 (78.3%)
Medical	21 (9.7%)
Palliative	26 (12%)
Parity	2 (1 – 3)
Gravidity	2 (1 – 4)
HIV positive	80 (37.3%)

SD : Standard Deviation ; IQR: Inter-quartile range.

Nature of Critical incidents

A total of 235 critical incidents were recorded among 217 patients. Two hundred patients (85%) had one critical incident each while 15% encountered more than one critical incident. As shown in Table 2 below, the three most prevalent critical incidents were omission of the surgical procedure, n = 107 (45.5%), followed by death, n = 66 (28%) and performance of unplanned surgery, n = 27 (11.5%). Sepsis and repeat laparotomy procedures accounted for 3% (n = 6) and 2% (n = 5) of the critical incidents, respectively.

Iatrogenic visceral injury (viz: bowel and bladder injury combined) had attributed to under 2% (n = 4) of the critical incidents. Venous thrombo-embolic phenomena accounted for less than one percent (0.8%) of the critical incidents. Among the 66 patients who died, 40 (61%) were HIV positive, and 26 (39%) were HIV negative (p = 0.09). The majority (94%; n = 62) of the deaths were among oncology patients, with only 2 (3%) and 1 (1%) urogynaecology and general gynaecology patients.

The "omission of procedure" was the most prevalent type of critical incident, followed by death (Table 2). We recorded 66 deceased patients, of which 62 were oncology, and 4 were general gynaecology patients. Among the 62 oncology deaths, 40 were patients with cervical cancer, 12 had ovarian cancer, 9 had endometrial cancer, and 1 had gestational trophoblastic neoplasia. The four general gynaecology deaths were as follows: 1 patient with a ruptured ectopic pregnancy, one with sepsis post myomectomy and two patients died of complications after puerperal sepsis. The least common incidents were iatrogenic bladder injury during surgery.

Table 2: Incidence and type of critical incidents (n = 235)

Type of critical incident	n (%)
Omission of procedure	107 (45.5)
Death	66 (28.1)
Unplanned surgery	27 (11.5)
Laparoscopy for acute salpingo oophoritis	8 (3.4)
Sepsis	6 (2.6)
Repeat laparotomy	5 (2.1)
ICU admission	3 (1.3)
Bowel injury	3 (1.3)
Intra-abdominal bleeding	3 (1.3)
Ectopic pregnancy	2 (0.9)
Thromboembolic incident	2 (0.9)
Repeat vaginal tear repair	2 (0.9)
Bladder injury	1 (0.4)

Reasons for the omission of procedure

As shown in Table 3 below, various reasons led to a total of 107 procedures being omitted. Lack of theatre time was the most common reason for procedure omission. Other notable reasons for procedure omission were lack of blood for transfusion or no blood products. Administrative issues such as no availability of high care or intensive care unit (ICU) beds, absence of porters to transport patients to the theatre and no electricity contributed to a total of 5% of omission of procedures. All patients were screened for SARS-CoV-2 (Covid-19) prior to admission during the pandemic, and SARS-CoV-2 (Covid-19) positive results contributed to less than 5% of procedure omissions. The remainder of the procedure cancellations were due to a wide variety of reasons, all individually accounting for less than 1% of the cancelled procedures.

Table 3: Reasons for omission of procedure (n = 107)

Description	n (%)
No theatre time	50 (46.1)
No blood products	9 (3.8)
SARS-CoV-2 (Covid-19) positive	7 (3.0)
New HIV diagnosis	6 (2.5)
Change in management plan	6 (2.5)
Medically unfit for surgery	6 (2.6)
No HCA* bed	4 (1.7)
No ICU* bed	4 (1.7)
Not fasted	2 (0.9)
Patient declined operation	2 (0.9)
No histology results	2 (0.9)
No porters available	2 (0.9)
No electricity	2 (0.9)
Low CD4 count	1 (0.4)
Incomplete pre-operative investigations	1 (0.4)
Reacted to blood transfusion	1 (0.4)
No anesthetist available	1 (0.4)

**HCA: High care area; ICU: Intensive Care Unit*

Details of unplanned surgical procedures

In the category of the 27 unplanned surgical procedures, the majority (66%, n = 18) was due to an emergency hysterectomy, with 14% (n = 4) being re-look laparotomy for bowel injury and 7% (n = 2) bladder surgery. Myomectomy (n = 1) and vascular surgery (n = 1) each contributed to 4% of the unplanned surgical procedures (Data not shown in a table).

Avoidable factors

Table 4 shows details of the total one hundred and six (106) avoidable factors that were recorded. The most common avoidable factors were administrative factors, contributing to a total of 75 (70%) cancellations. The most (46%; n = 49) common avoidable reason in this category was inadequate

theatre time, followed by lack of blood products (9%, n = 8), lack of high care or ICU beds (8%, n = 8) and inadequate patient preparation (6%, n=6). Staff shortages (3%, n = 3) contributed to the least proportion of avoidable cancellations.

Patient factors were the next common category of avoidable factors contributing to a total of 15 (14%) cancellations. In this category, delay in seeking medical care (11%, n = 11) was more common than the performance of unsafe abortions (4%, n = 4). The next most prevalent category was medical care (8%, n = 8). Under this category, the most common factor was an error in diagnosis (5%, n = 5). Problems of inappropriate care (n = 1) and inadequate patient monitoring (n = 1) were each contributing under 1%.

As shown in Table 4, care at inappropriate facility levels contributed to 4% (n = 4) of avoidable factors. This was due to palliative care being provided in a secondary or tertiary care hospital. Delays in diagnosis also contributed to 4% (n = 4) of the avoidable factors. In this category, omission of a screening or diagnostic test (3%, n = 3) was a more common cause of delay in diagnosis when compared to actual delay to a tertiary level care facility (1%, n = 1).

Table 4: Avoidable factors (n = 106)

Description	n (%)
Administrative factors (75)	
Lack of theatre time	49 (46.2)
Lack of blood products	9 (8.5)
Lack of HCA or ICU bed	8 (7.5)
Inadequate patient preparation (not starved, no results)	6 (5.7)
Staff shortages	3 (2.8)
Patient factors (n = 15)	
Delay in seeking medical care	11 (10.4)
Unsafe abortion	4 (3.7)
Medical care (n = 8)	
Diagnosis	6 (5.7)
Inappropriate level	1 (0.9)
Monitoring problem	1 (0.9)
Inappropriate facility (n = 4)	
Palliative care in a secondary or tertiary hospital	4 (3.7)
Delay in diagnosis (n = 4)	
Screening/diagnostic test not performed.	3 (2.8)
Delay in referral to a tertiary institute	1 (0.9)

Comparison by hospital of admission

Table 5 shows the comparisons of hospital admission between SBAH and KPTH. Only the admission unit and type of admission were significantly different ($p < 0.05$). However, the other characteristics, including age, parity, gravidity and HIV-positive status, were not statistically different between the two hospitals.

Table 5: Comparison of key findings by hospital

	SBAH	KPTH	
Description	Median (IQR) or n (%)	Median (IQR) or n (%)	P-value
Age years (n = 217)	44 (34 – 57)	42 (34 – 54)	**0.34**
Unit of admission (n = 217)			**0.001**
Oncology	82 (68.3)	52 (53.6)	
General gynaecology	9 (7.5)	45 (46.4)	
Uro-gynaecology	20 (16.7)	0 (0)	
Reproductive gynaecology	8 (6.7)	0 (0)	
Obstetrics	1 (0.0)	0 (0)	
Type of admission (n = 217)			**0.001**
Elective	58 (48.3)	60 (62.4)	
Oncology	39 (32.5)	18 (18.5)	
Emergency	23 (19.2)	19 (19.25)	
Treatment intention (n = 217)			**0.12**
Surgical	92 (76.7)	84 (86.6)	
Medical	17 (14.2)	7 (7.2)	
Palliative	11 (9.1)	6 (6.2)	
Parity (n = 217)	2 (1 – 3)	2 (2 – 3)	**0.43**
Gravidity (n = 217)	2 (1 – 3)	3 (2 – 4)	**0.11**
HIV positive (n = 80)	43 (35.8)	37 (38.1)	**0.92**

**P-value obtained from Wilcoxon Rank-Sum, Chi-Square or Fischer's Exact test*

DISCUSSION

This study reported the overall incidence rate and the nature of critical incidents among gynaecological hospital admissions at Steve Biko Academic and Kalafong Provincial Tertiary Hospitals in Gauteng Province of South Africa. The overall incidence rate of critical incidents among gynaecological patients over 12 months was 6.7%. The incidence rates were not significantly different between the two hospitals,

which was unsurprising as the patients' profiles were largely similar. The results from this study are slightly less than the WHO data, which estimates that about 10% of patients are affected by critical incidents.[4] It was reassuring to note that our results are comparable to reports from two South African studies focussing primarily on gynaecological patients. A study at Kalafong Provincial Tertiary Hospital by Lombaard et al.[3] reported a critical incident rate of about 8%, similar to the 7% we reported.[3] A study at King Edward Hospital VIII in KwaZulu-Natal province in 2005 found an adverse incident rate of 11%.[1]

Characteristics associated with critical incidents

The patients who suffered critical incidents had a median age of 42 (34 – 54) years. From published data, increasing age is a known risk factor for critical incidents.[2-3] A study by Wilson and colleagues in developing countries demonstrated a dose-response relationship between age and incidence of critical incidents.[22] They suggested that the observed association existed as increasing age is associated with fragility. Many patients who experienced critical incidents were gynae-oncology patients, which could be related to the fact that they are chronically unwell and more likely to have repeated admissions. It is, however, important to note that most of these patients were admitted for elective surgical treatment.

The prevalence of HIV in this study sample was fairly high at 37%. This was higher than the commonly cited 25% prevalence among the general population of women (aged 15 – 64) in South Africa.[26] It is still even higher than the commonly cited 30% prevalence among sexually active and pregnant women attending antenatal care, who are at a much higher risk of HIV acquisition.[26-27] The results show that most (60%) deceased patients were HIV-positive. Therefore, the observed high HIV prevalence rate could explain the higher predominance of deaths as a cause of critical incidents obtained in this study.

Spectrum of critical incidents

The most (45%) prevalent type of critical incident was "omission of procedure" (n = 107), and it was predominantly the cancellation of surgical operations for various reasons. For example, a total of 49 operations were cancelled due to lack of theatre time, while other reasons for cancellation were lack of ICU/HCA beds, blood shortages, and poor patient pre-operative preparation. This type of critical incident is frequently associated with high morbidities, such as psychological stress among patients, which may result from financial losses because of additional hospital stays, medical expenses, and a loss of income.[17,19] It is also plausible that such incidents lead to patients losing confidence and dissatisfaction with the public health sector.[6,14]

Death was the second most prevalent critical incident after procedure omission. A total of 66 deaths were recorded over the 3225 admissions giving an overall mortality rate of 2.2%. This is comparable to what is published in the literature. Most of the deceased were oncology patients, with cervical cancer being the leading cause of oncology deaths. The two South African studies into critical gynaecological incidents showed a mortality of 2.1% of all admissions 1 and 2.2% of all admissions.3 The finding of this study is also consistent with the low mortality rate among gynaecological hospital admissions of 1.2% (95% CI, 0 – 2.5%) reported in a previous meta-analysis.[2]

It is critical to note that unplanned surgical procedures were the third largest contributor towards critical incidents. The fact that most of these were due to emergency hysterectomies emphasises the need to ensure that frontline emergency healthcare workers in gynaecological departments, such as medical officers and registrars, are taught and proficient in conducting this procedure. Our data also shows that iatrogenic bowel and bladder injury was the next predominant cause of unplanned surgery as they contributed 3% (n = 6) of the unplanned operations, thus accounting for about 3% of the critical incidents. The reasons for the occurrence of these iatrogenic bladder and bowel injuries could not be ascertained from this study. Previously published data show that inexperienced surgeons have a higher rate of complications when compared to highly experienced surgeons.[28-29] Therefore, future studies can be conducted to confirm if junior or inexperienced surgeons show a higher rate of iatrogenic injuries than experienced surgeons in our setting.[30]

Avoidable factors

The data in this study show that one hundred and six (106) of the critical incidents were potentially avoidable factors. The most common avoidable factors were in the category of administrative factors (70%). In this category, lack of theatre time was the most common determinant and accounted for almost half of the avoidable factors, followed by lack of blood products, high care or ICU beds, and inadequate patient preparation for the surgical procedure. The WHO estimates that up to 50% of critical incidents are avoidable.[4] It is important to highlight that these administrative factors can be prevented by simple measures such as ensuring that the number of cases booked on the theatre slate can be completed in the allocated theatre time, thus minimising cancellations due to lack of theatre time.[31]

A South African study on improving the efficiency of using theatre made recommendations which include: standardised booking forms with time allocations per case and predicted operating times to aid in appropriate scheduling of cases; clearly defined first-case start times that must be communicated to all theatre users and improved communication between senior anaesthetists and surgeons to scrutinise potentially early-terminating lists, and plan for adding an additional case to the list.[32] Next, proper planning, including arranging for a cell saver and securing blood products and high-care or ICU beds well in advance of the operation, will go a long way in minimising cancellations. It is equally important to ensure that the patients have a thorough diagnostic examination, have all the required results in the file and are also counselled and educated on the procedures and expectations, such as to keep nil per os for at least 6 hours before the operation.[31]

Since patient-related factors were the next prevalent category for avoidable factors, several strategies can be implemented to minimise them. In this study, it is plausible that simple measures such as improved patient education to seek care early could significantly reduce the proportion of adverse incidents due to patient factors.[10, 33] Similarly, healthcare factors which might make women hesitate to seek care, such as long queues and bad staff attitudes, need to be addressed to minimise patient factors. [34]

In this study, 8% of the avoidable factors were in the medical care category. Medical care-related adverse incidents could also be reduced by improving the knowledge of the

staff working at various healthcare system levels.[20] This is because most of the reasons for avoidable critical incidents in this category were errors in making the diagnosis. Health education would also address the other factors we noted, such as inadequate care provision and substandard patient monitoring.[20, 29]

Comparison of study findings by hospital of admission

The results show that the patient profile and critical incident rates did not differ between the two hospitals. The only notable differences were in the unit of admission as well as the type of admissions. Such differences are explained by the fact that SBAH has more subspecialties when compared to the KPTH.

Limitations and strengths of the study

This was a prospective descriptive study, and we faced limitations inherent to such studies, such as missing patient files and data variables incompletely filled in. We could not analyse the relationship between age and the incidence of critical incidents. This study may also have been affected by observer bias when it came to analysing patient outcomes. We relied only on critical incidents reported in various records, and we did not go through all the medical records of patients admitted during the study period to find unreported incidents. Existing data shows that critical incident reports have poor quality data compared to reviewing the actual medical records.[17, 25]

The study was conducted during the SARS-CoV-2 (Covid-19) pandemic. A positive SARS-CoV-2 status contributed to at least 3% of the procedure cancellations. The impact of SARS-CoV-2 (Covid-19) on the prevalence of critical incidents could not be explored as there was no comparator group (i.e., data collected before the SARS-CoV-2 pandemic).

However, despite these limitations, this study provides an important addition to the epidemiology of critical incidents among gynaecology patients. It was also reassuring that our findings were largely comparable to similar studies done in South Africa and globally. The findings from this study, thus, can be generalised to some extent to other healthcare facilities in South Africa and can be used to make recommendations to minimise critical incidents. They also form a basis for comparison for other future studies.

CONCLUSION

Critical incidents are an important cause of morbidity and harm among gynaecology patients receiving healthcare services at Steve Biko Academic Hospital and Kalafong Tertiary Provincial Hospital. A significant proportion of these critical incidents are avoidable. Therefore, this needs an urgent call to action to adopt measures to eliminate them and improve patient safety. Most reasons for cancelling surgical procedures can be avoided by improving administrative practices. Such measures include standardised booking forms with time allocations per case and predicted operating times to aid in appropriate scheduling of cases; accurate clock-in and clock-out times that are documented; pre-booking to ensure availability of blood products, high care or ICU beds as well as proper patient work up to avoid issues like missing results. Training staff in the importance of accurately recording and reporting critical incidents is needed.

Given the general lack of data on critical incidents in the country, more research is needed in this area. One way to achieve this is to create a country-wide universal database platform where all data are captured. Such a substantial data system could provide more robust data that can be used to guide policies and strategies to reduce morbidity and mortality from mainly potentially avoidable adverse incidents. Even though this initiative may require a substantial initial financial outlay, it is plausible that it has a favourable cost-benefit profile as costly procedures and, even to some extent, huge legal bills can be avoided by minimising unnecessary morbidity and mortality from critical incidents.

Since incorrect diagnosis and inadequate care contributed to a significant proportion of avoidable critical incidents, the potential impact of adequate training for staff at all levels of care cannot be underestimated.35 Such approaches could minimise critical incidents, improve the quality of care, and limit the number of costly legal action suits against the health departments from disgruntled patients.

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