

Effects of delayed treatment on perforated peptic ulcers at Kenyatta National Hospital (KNH)

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Abstract

Background: Perforations complicate up to 5-10% of peptic ulcer diseases. Mortality following peptic ulcer perforation can peak 29%. Of the factors that influence the outcome of peptic ulcer perforation, treatment delay is most important and modifiable. This study reviewed delay and how it affected outcome in patients treated for perforated peptic ulcers at the Kenyatta National Hospital.

Methods: Patient's files for the period January 2002 to December 2007 were reviewed and direct interviews carried out for patients seen from January to December 2008. Data sought included patient demographics, clinical presentation, time from symptom onset to presentation at casualty, time from presentation at casualty to surgical treatment and the treatment outcomes. Data was entered using a structured data sheet/questionnaire. The effect of delay as a determinant of outcome was evaluated using univariate analysis.

Results: One hundred and ninety three patients were evaluated. Twenty four patients (12.4%) died. Sixty one patients (31.6%) developed complications post-operatively. Thirty patients were re-operated for the complications. No patient treated within 24 hours died. Complications rate was 0 %, 1.5% and 29.5% for patients treated within 24 hours, 24-48 hours and after 48 hours respectively. Delay >48 hours was significantly associated with increased mortality (p value <0.001), morbidity (p value <0.001), and surgical site infections (p value <0.001). The mean length of hospital stay for patients with delay <48 hours and over 48 hours was 7.22 (+ 1.9) and 19.7 days (+ 19.1) respectively (p<0.001).

Conclusion: Delay of more than 48 hours is associated with high morbidity and mortality. Efforts should be made to reduce the amount of pre-treatment delay to less than forty eight hours.

Introduction

Peptic ulcer perforation is the second most frequent abdominal emergency that requires surgery. Perforation occurs in up to 10% of patients with peptic ulcer disease (1). Perforation is predominantly a surgical disease and surgery should proceed as soon as a patient is resuscitated. However, recent data indicates a worrying trend towards longer treatment delays when compared to earlier studies (1). In Norway, Svanes et al have shown a steady increase in treatment delay between the years 1935-1990, especially so for in-hospital delay (2).

Delays of more than 24 hours increase surgical mortality seven-eight fold, complication rate three fold and length of hospital stay two fold in the Western world (3).

The patterns and adverse effects of treatment delay have not been evaluated in Kenya. An understanding of this aspect is potentially relevant in guiding the treatment protocols at our institutions.

Patients and Methods

This descriptive study involved consecutive selection

of patients treated surgically for perforated peptic ulcer disease at KNH between Jan 2002-Dec 2008. The study was approved by the KNH ethics board. The information sought included patient characteristics, treatment delays, treatment complications and length of hospital stay.

Treatment delay encompassed both pre-hospital and intra-hospital delay. Pre-hospital delay was the time in hours from onset of pain to presentation at the hospital's casualty department. Intra-hospital delay was defined as the time in hours from arrival at casualty to operative treatment. Simple repair and Graham patch formed the mainstay of treatment for patients with peptic ulcer perforations (190 of 193). Only three patients had a definitive repair done for their perforation. No patient had a laparoscopic surgical repair done for their perforated peptic ulcer.

The information sought was collected by the first author by means of a structured data sheet and the analysis performed using SPSS program version 11.5.

The total delay time was used to stratify the patients into three delay groups: <24 hours, 24-48 hours and over 48 hours.

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For descriptive purposes, data were presented as means with standard deviation for continuous variables or as absolute and relative frequencies for qualitative variables. The Student t test was used for the comparison of continuous variables. Categorical and binary variables were tested by Fisher's exact test/chi square test. A P value of <0.05 was accepted as significant.

Results

One hundred and ninety three (193) patients were recruited during the study period. One hundred and fifty one (151) patients had their records reviewed (2002-2007) while forty two patients were directly interviewed by the researcher (January 2008 to December 2008). An annual incidence of 27.5 patients per year was recorded in this study period. Most (90.7%) patients were male (Table 1).

The patient's ages ranged from 16 to 84 years. The mean age for women was 35.78 (+ 15.9) years while that for men was 34.35 (+ 10.8) years. Younger patients were predominantly affected (Fig. 1); patients younger than 40 years (especially in the third and fourth decades) accounted for 74.6% of all cases while those above forty years of age formed 25.4%.

The anterior duodenum was the most common (78.2%) site of perforation (Table 1). while the descriptive nature of the perforation was acute, chronic or unspecified in 31.6%, 19.7% and 48.7% of cases.

Patterns and impact of treatment delays

Patients presented to hospital within a range of 1-168 hours from approximated time of perforation. Most (63.2%) presented to hospital within 24 hours from the start of their symptoms. The mean time to presentation to hospital was 36.05 hours (Std deviation 31.14 hours, median 23 hours). Males presented to hospital earlier than their female counterparts by a difference of up to eighteen hours (34.3 hours vs. 52.5 hours) (p value 0.012). The intra hospital delays were similar for the genders.

The total time from onset of symptoms to treatment ranged from a minimum of two hours to a maximum of 240 hours with a mean time to treatment of 58.03 hours (Std deviation 43.52 hrs). Seventy four percent (74.5%) of patients were operated on within twenty four hours of hospitalization. The rest were delayed due to several reasons including delayed diagnosis, initial admission

Characteristics	Number of Patients	%
Gender		
Male	175	90.7
Female	18	9.3
Age		
<40 years	144	74.6
>40years	49	25.4
Site of perforation		
Anterior duodenal	151	78.2
Posterior duodenal	2	1.1
Gastric	40	20.7
Nature of perforation		
Acute(benign)	61	31.6
Chronic(benign)	38	19.7
Not specified	94	48.7
Pre-treatment Delay (hrs)		
<12 hours	1	0.5
12-24 hours	21	10.9
24-48 hours	98	50.8
>48 hours	73	37.8

Table 1: Characteristics of peptic ulcer perforation patients at KNH

to the medical ward, instances where patients were too ill and needed prolonged "stabilization" before undergoing surgery and for other unstated reasons.

Morbidity

Sixty one patients (31.6%) developed complications after treatment. The most common complication was surgical site infections (intestinal leak, wound dehiscence, wound sepsis, deep seated infections like peri-hepatic and intra abdominal abscesses, peritonitis) in 49 patients (25.8%). Other post-operative complications included intestinal obstruction in two patients, acute renal failure in four patients who died, poor reversal from anesthesia leading to admission into the intensive care unit (two patients), paralytic ileus (one patient) and pneumonia (one patient).

The mean pre-treatment delay was 105.4 hours for the complications group (Standard deviation 45.52 hrs, and 35.4 hours in the group with no complications (std dev 15.32 hrs, 1.36 hrs) (p <0.001). In 22 patients with pre treatment delays less than 24 hours, none recorded any complication while sixty of 164 patients with delays >

Fig 1: Age distribution for perforated ulcers

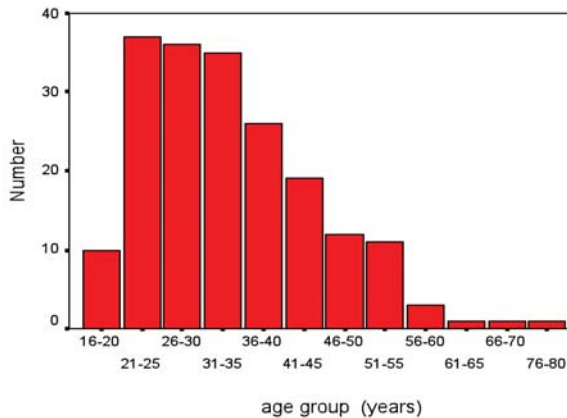
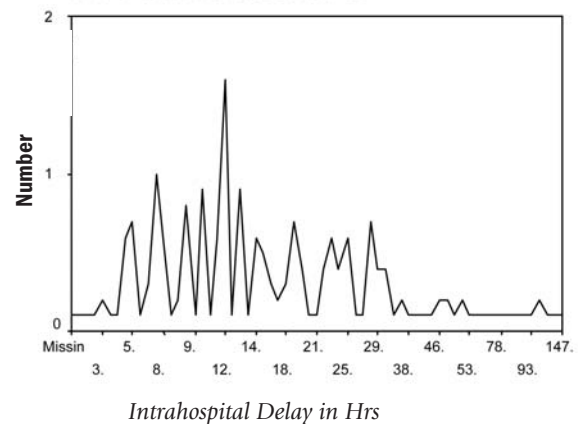


Fig 2: Intrahospital Delays



24 hours developed complication ($p < 0.001$). Delays < 48 hours were associated with morbidity in three (2.6%) patients while 57 patients (78.0%) with delays > 48 hours developed complications (p value < 0.001). There was also a statistically significant (p value < 0.001) effect of delay over 48 hours on surgical site infections. Those who delayed more than 48 hours were 2.6 times more likely to develop surgical site infections compared to those who presented earlier. Three patients (3/112) who presented within 48 hours suffered surgical site infections compared to their counterparts (46/71 patients).

Length of hospital stay

The length of hospital stay ranged from 2-136 days while the average stay was 12.08 days.

Patients with delay of < 48 hours had a mean hospital stay of 7.22 days compared to 19.7 days for those receiving treatment after 48 hours ($p < 0.001$).

Mortality

Twenty four patients died in hospital before discharge representing 12.4% of all patients treated. Patients who presented to hospital and were operated within 24 hours of the start of their symptoms recorded no death as compared to those operated > 24 hours where 23 of 164 pa-

tients died ($p = 0.045$).

There was no mortality for those treated less than 48 hours with all mortality occurring to those treated after 48 hours i.e. 23 of 73 patients (30.1%) p value < 0.001 (table 2).

Those patients who were operated less than 48 hours since their symptoms started had fewer surgical site infections compared to those operated after 48 hours from the time their symptoms started. P value < 0.001

Discussion

This study has documented an increasing disease burden, predominant involvement of young males and prolonged pre-treatment durations. The annual incidence of 27.5 is higher than the rate in a 1980 study (4). The actual rate may be closer to the 40 recorded in the controlled and prospective arm of the current study. Several studies in Africa have documented increasing incidence of perforated PUD in younger persons (4-6), possibly due to increasing risk factor levels (7). Although the over involvement of males may be attributable to protective influence of estrogens (8), the Kenyan male in this cohort is likely to be smoking, taking alcohol or unemployed (9), a risk factor profile similar to elderly females who seem to be the affected cohort in the West (1,10).

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The respective overall morbidity and mortality rates of 31.6% and 12.4% are consistent with previous accounts that put morbidity and mortality associated perforations at 30-50% and 5-31% respectively (10-14). Several factors have been associated with increased complications and death including presence of co-morbidity, shock, ASA class and delay in treatment. The latter was the focus of this study. Following duodenal perforation, the secretions are sterile in the first 12 hours. As the time of delay increases infection sets in causing more surgical site infections, septicaemia, shock and possibility of death (3). The characteristic patterns of delay in our study include pre-hospital delays longer than 24 hours and gender disparity in pre-hospital delay.

The average time to presentation was 36.3 hours, three times longer than the 12 hour cut-off used in Western literature to define delay (3). Only one patient received treatment within the 12 hour definition with 11.8% receiving treatment within 24 hours of symptom onset. Such treatment delays are not surprising within the tropical environment, occasioned by poor infrastructure (7, 15, and 19) and poverty.

Post-surgical complications were significantly associated with the pre-treatment delays. Morbidity and mortality rates were higher and the lengths of hospital stay longer for female patients who also happened to present late to hospital. As highlighted before, a 12-hour cut-off for delay would not be reasonable for our patients. When dichotomized to those receiving treatment within 48 hours and those after this period, the former recorded complications in three of 113 patients as compared to 57 of 73 patients in the latter group.

Twenty four patients (12.4%) died after treatment. Similar rates have been reported in the region (4, 6, 12). All the deaths occurred in the group of patients who received treatment after 48 hours. The 48 hour cut-off could seem not deleterious because of our cohort characteristics. Cohorts in Western reports are much older than the young population we have studied, with more physiological reserves to withstand insults caused by pre-treatment delays.

This study had limitations. Although it was possible to determine precise intrahospital time delay, the prehospital delays may have been characterised by recall biases especially in the retrospective chart review. Difficulty in retrieval of other information in the retrospective arm of

	Mortality occurred before discharge	No mortality reported	P value	OR (95%CI)
Site of perforation				
Duodenal	16	137	0.103	1.119
gastric	8	32		(0.950-1.319)
Sex				
Male	18	157	0.005	1.346
Female	6	12		(0.967-1.873)
Surgical site infection				
yes	15	34135	<0.001	0.740
no	9			(0.612-0.896)
Non infection complication				
yes	10	631	0.027	0.544
no	14			(0.281-1.056)
Age				
<40years	15	129	0.145	1.097
>40 years	9	40		(0.950-1.267)
Delay				
<24 hours	0	22	0.045*	1.163
>24hours	23	141		(1.093-1.237)
Delay				
<48hours	0	113	<0.001*	1.460
>48hours	23	50		(1.250-1.706)
Reintervention				
yes	13	17	<0.001	11.624
no	10	152		(4.429-30.504)

* Fischer's exact test.

Table 2: Determinants of mortality.

the study was also common.

In conclusion, majority of patients with perforated ulcer are treated after 24 hours of onset pain. Definitive treatments may safely be undertaken within 48 hours. After this time, morbidity and mortality rise significantly.

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