

## Risk Factors for Acute Perforated Duodenal Ulcers in Erbil Governorate-Kurdistan, Iraq

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### ABSTRACT

**Background and objectives:** Acute perforations of duodenal ulcers continue as one of the real emergencies of surgery which require immediate attention and prompt operation. The aim of this study was to evaluate the probable risk factors for perforation of duodenal ulcer, highlighting any prevalent one in the occurrence of perforation in Erbil governorate. Design: Retrospective study. The cases were selected on the basis of structured protocol. Setting: The study was performed on 124 patients with perforated duodenal ulcer attending the emergency departments of the three major hospitals in Erbil city (Erbil emergency hospital, Hawler teaching hospital and Hawler private hospital) Erbil governorate located in Iraqi Kurdistan over a period of 4 years

**Methods:** The study was performed on 124 patients with perforated duodenal ulcer over a four year period (Jun. 2000- Jun. 2004). A number of probable risk factors for perforation of the duodenal ulcer were studied. Asymptomatic patients who perforated were studied as a separate group

**Results:** one hundred twenty four patients with duodenal ulcer perforation were studied, 111 male and 13 female (male to female ratio 8.5:1) about 60% of patients were within their 4th and 5th decade of age. Patients residing in the rural areas had a lower incidence of perforation (39%) than that living in the urban areas (61%). seventy four patients (59.6%) were asymptomatic before they developed the perforation. Sixty six patients (53.2% of the total number) developed the perforation during Ramadan fasting months (four out of the total 48 months), sixty five percent of the cases were smokers. Stress and smoking played a significant role in the occurrence of perforation in 83% of cases

**Conclusions:** Stress, smoking and fasting played a major role as a risk factor in the occurrence of duodenal ulcer perforation. A high incidence of perforation occurs during the months of Ramadan fasting, especially those without or on irregular treatment. The incidence of asymptomatic patients who were fasting and under stress, who then perforated was high

**Keywords:** peptic ulcer perforated duodenal Ulcer, risk factors.

### INTRODUCTION:

Half a century ago perforated duodenal ulceration was mainly seen in young men, yet today, due to awareness of H. pylori infection and increasing NSAIDs usage it is a problem mainly seen in elderly women. Whilst the overall admission with duodenal ulceration is falling, the overall number of ulcer perforation remains the same<sup>1</sup>. H. pylorus is a gram negative spiral microaero-

-philic bacillus specific for human gastric mucosa<sup>2</sup>. It produces urease creating an alkaline microenvironment. It is probably causative in duodenal ulcer and may be associated with duodenal ulceration<sup>2,3</sup>. Acute perforations of duodenal ulcers continue as one of the real emergencies of surgery which require immediate attention and prompt operation. With the introduction of H2 receptor antagonist in 1976, there is

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significant reduction of elective surgical cases carried out for duodenal and gastric ulcers<sup>1</sup>. However the incidence of complications associated with peptic ulcer disease particularly perforation (5 - 10%) has not changed appreciably despite the wide spread use of gastric antisecretory agents and eradication therapy<sup>2</sup>. The association of various probable risk factors such as smoking, alcohol, inadequate dietary intake, and non-steroidal anti-inflammatory drugs has been studied widely<sup>5</sup>. However, there has been a considerable change in the epidemiology of perforated duodenal ulcer over the last decade. Previously, most patients were middle aged, but with time, there has been a steady increase in the age of patients suffering this complication. It has been mentioned that the majority of patients have a preceding history suggestive of chronic duodenal ulcer, but about one third of patients have no history of ulcer or dyspepsia or one which extends to only a week or two<sup>5</sup>. Modern antiulcer therapy like the proton pump inhibitors with the antihelicobacter agents, has decreased the recurrence rate after simple closure of the perforation from 42% to 6%<sup>6,9</sup>. The effects of stress, fasting and smoking in the establishment of duodenal ulcer and the development of its perforation must not be ignored.

#### MATERIALS AND METHODS:

One hundred twenty four patients with a diagnosis of perforated duodenal ulcer were included in the study over four-years period (Jun. 2000 -Jun. 2004). The age, sex, and residence were studied. Patients known to have a history of duodenal ulcer were divided into three groups (on regular treatment, on irregular treatment and those on no treatment). Patients who were asymptomatic till perforation are a separate group. The risk factors studied included: stress, smoking, fasting, family history of duodenal ulcer, intake of non steroidal anti inflammatory drugs (NSAIDS), alcohol, sex: male gender is a risk factor for peptic ulcer perforation and age: an increase in fre-

quency of perforation in middle age reflects that age is a risk factor for peptic ulcer perforation.

#### RESULTS:

During the study period, 124 patients proved to have perforated duodenal ulcer, 111 males and 13 females, the age and sex distribution are shown in Table 1. Perforated DU is more common in the age group 32-48 years. Forty eight patients (39%) were from rural areas and 76 (61%) were residing in urban areas.

**Table(1):** Age and sex distribution for 62 patients with perforated Duodenal Ulcer.

Age	Male No.	Female No.	Total No.	%
<20	4	2	6	4.8
20-29	20	2	22	17.7
30-39	28	2	30	24.2
40-49	24	4	28	22.6
50-59	17	1	18	14.5
60-69	13	1	14	11.4
>70	5	1	6	4.8
Total	111	13	124	100

The number of patients who were asymptomatic prior to perforation was seventy four (59.6%), forty two (56.7%) of these patients perforated during the months of Ramadan fasting. Fifty patients (40%) had a history of duodenal ulcer or dyspepsia. Of these, twenty were on no treatment, eighteen on irregular treatment and twelve on regular therapy. The numbers of patients having the observed risk factors are shown in Table 2.

**Table(2):** Incidence of perforation according to the risk factors.

Risk factors	No. of patients	%
Stress	47/62	75.8
Smoking	43/62	69.4
Fasting	33./62	53.2
Family history	21/62	33.9
NSAID	20/62	32.2
Alcohol	17/62	27.4

Sixty six patients (53.2%) had their perforation during the Ramadan fasting months while fifty eight (46.8%) perforated during the rest of the study period (44 months), these numbers include all patients either symptomatic or asymptomatic. Out of the sixty six patients perforated during the Ramadan fasting, forty two (63.6%) were asymptomatic and twenty four (27.4%) were known to have duodenal ulcer, fourteen of them were on no treatment and ten on irregular therapy. Fifty eight patients perforated during the 44 months of non fasting period. thirty two of them were asymptomatic and twenty six symptomatic, ten of them were on no treatment and sixteen on regular therapy. On comparing the number of perforations per month of fasting to the number of perforation per one month of non fasting, i.e. 66/4 in comparison with 58/44, the results will be statistically highly significant  $p < 0.01$  ( $z = 3.89$ ) indicating that fasting is a highly significant risk factor for perforation. Ninety four patients (75.8%) gave a significant history of different events of stress (worry from the war situation in the country. Loss of a close relative, economic difficulties with the economic block, work or family problems complicated during the war). The patient distribution was more or less even during the study period. eighty six patients (69.4%) were heavy smokers. This factor was common during the years (Ramadan fasting and non fasting months) as patients used to smoke heavily during the nights of Ramadan as well. Thirty four patients (27%) who perforated were also Alcoholics, were distributed evenly during the study period. Forty (32.2%) who perforated gave a history of taking (NSAIDS) for chronic painful conditions. Forty two patients (34%) reported a family history of duodenal ulcer. The remaining patients had no idea about such a disease in the family. Of the total number of 124, forty six patients (39%) were from rural areas and seventy six patients (61%) were from the urban areas. In this study (80%) of patients had positive H. Pylori

## DISCUSSION:

Acute perforations of duodenal ulcers continue as one of the real emergencies of surgery which require immediate attention and prompt operation<sup>3, 8</sup>.

People who have a family history of duodenal ulcer are more likely to get them, and the problem is four times greater in men than in women over fifty years of age. Other risk factors include having a Helicobacter pylori infection, using non steroidal anti-inflammatory drugs such as aspirin and ibuprofen, and the use of cigarettes and alcohol<sup>6, 8</sup>. In spite of overall decline in the incidence of peptic ulcer disease, the incidence of perforated duodenal ulcer has not been reduced. This may be due to the increased use of non steroidal anti-inflammatory drugs over the last twenty years<sup>1, 3, 4</sup>. This was not the case in our study as only (32.2%) of patients who presented with perforated duodenal ulcer gave a history of using non steroidal anti inflammatory drugs. Our results indicate that perforation of a duodenal ulcer is more common in males in agreement with other studies<sup>10, 11</sup>.

This sex difference is attributed probably to the psychological and smoking habits in this society as the male predominance recently declining. In the western countries with the changing pattern of smoking and increased stress in the working women<sup>12</sup>, the peak age for ulcer prevalence is different among different studies, and in different populations and time. In one study, ulcers were more frequent in the fourth decade and rare in subjects under the age of twenty<sup>13</sup>.

In our study, duodenal ulcer perforation occurred in 72 cases out of the total number 124 (58%) in the age between 30 and 59 and less frequent after the age of 60. There were little significant differences in this study in terms of perforation between people living in rural and urban areas. This is probably due to the migration between the two communities during the last twenty years due to the social changes in the

country. The presence of first degree relatives with duodenal ulcer increases the risk to develop ulcer disease and its complications. This familial aggregation of ulcer is multifactorial, sharing psychological stress, food habits, in addition to the same genetic factors<sup>14</sup>. This could also apply in our society to explain similar results. As smoking and coffee intake is known to have a number of adverse effects on mucosal aggressive and protection factors<sup>1,20</sup>, a strong association is found in this study between cigarette smoking and prevalence of peptic ulcer perforation, especially in men. However In our study, fasting played an important role in duodenal ulcer perforation, this may be explained in that missing one of the important three daily meals, during fasting, with prolonged un-neutralization of gastric acidity, especially in smokers during the nights of Ramadan, can decrease the defensive mechanisms of gastric mucosa causing ulcer and then perforation<sup>16,18</sup>. The high incidence of duodenal ulcer perforation in patients under stress cannot be ignored in our society. It seems that stress is a significant factor. This might reflect the effects of the war situation with the long lasting economic blockade in this country and its lethal sequelae. Sixty percent of our patients were asymptomatic i.e. have no history of duodenal ulcer during the period preceding the perforation. This is not in agreement with other reports<sup>5</sup> where only about one third of their patients who present with perforation were asymptomatic. This high incidence of perforation without preceding history is explained on the fact that all the Iraqis over that period were under stress especially those who were fasting Ramadhan. Fasting, stress and smoking are the leading risk factors in the study have their serious effect on patients with duodenal ulcer as a precipitating factor for the development of serious complication of perforation. Our study confirms other previous reports suggesting beside other risk factors that there is a reversible increase in acid and pepsin secretion, which may be involved in

increasing of dyspeptic symptoms seen during Ramadan<sup>2,13</sup>, and changes in lifestyle, which may be associated with an increase of the gastric acidity mainly in the diurnal phase<sup>14,15</sup>, we find an increase in the peptic ulcer disease and complications especially frequency of duodenal ulcer perforation were more frequent in the month of Ramadan. we think that an increase in frequency of perforation in middle age reflects that age is a risk factor for peptic ulcer perforation<sup>16</sup> rather than Ramadan fasting. This may be due to an increase in the incidence of Helicobacter pylori infection with age as the incidence of H. pylori infection in those over 50 years and 70 years is >50% and >75% respectively, or due to vascular devitalization<sup>17</sup>.

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