

VOL 11

# *Gastrointestinal Haemorrhage*

EDITED BY

P. S. HUNT MS FRACS

CLINICAL SURGERY INTERNATIONAL

VOL 11

# Gastrointestinal Haemorrhage

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**CHURCHILL LIVINGSTONE**

EDINBURGH LONDON MELBOURNE AND NEW YORK 1986



CHURCHILL LIVINGSTONE  
Medical Division of Longman Group Limited

Distributed in the United States of America by Churchill  
Livingstone Inc., 1560 Broadway, New York, N.Y. 10036, and  
by associated companies, branches and representatives  
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publishers (Churchill Livingstone, Robert Stevenson House, 1-3  
Baxter's Place, Leith Walk, Edinburgh EH1 3AF).

First published 1985

ISBN 0 443 03074 X

British Library Cataloguing in Publication Data  
Gastrointestinal haemorrhage. — (Clinical  
surgery international, ISSN 0263-4422; v. 11)  
1. Gastrointestinal hemorrhage  
I. Hunt, P.S. II. Series  
616.3'3 RC802

Library of Congress Cataloging in Publication Data  
Main entry under title:  
Gastrointestinal haemorrhage.  
(Clinical surgery international, ISSN 0263-4422;  
vol. 11)

Includes index.  
1. Gastrointestinal hemorrhage—Surgery.  
2. Gastrointestinal system—Surgery. I. Hunt, P. S.  
II. Series: Clinical surgery international; v. 11.  
[DNLM: 1. Hemorrhage, Gastrointestinal.  
W1 CL795U v.11/W1 143 G2564]  
RD540.G377 1986 617'.43 85-13259

Printed in Great Britain by  
Butler & Tanner Ltd, Frome and London

# Preface

In contrast to the postwar period to about 1970, the last decade has seen considerable advances in the management of gastrointestinal haemorrhage. This has arisen mainly from specialized attention to the problem, supported by advances in resuscitation and intensive care. Specialization has produced the attention to detail, timing of established treatment and experience necessary for successful clinical practice. Fiberoptic endoscopy has improved diagnostic accuracy, facilitating the introduction of planned management. As a consequence, morbidity and mortality have been reduced by early control of bleeding in high-risk cases.

The authors have been asked to write chapters on these aspects of management, as well as certain additional topics, including bleeding from the lower gastrointestinal tract. A more rounded view than usual has been sought, the intention being to describe each topic in the context of the author's clinical practice. As a consequence, some overlap will be found, particularly in relation to contentious issues. It has also been planned that chapters be based upon sound pathophysiological principles with speculation about future development. My thanks to the authors for their endeavours.

Melbourne, 1986

P.S.H.

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# 1

## Natural history and mortality trends of acute upper gastrointestinal haemorrhage

D. W. PIPER and D. STIEL

### Relevance of aetiology to mortality

The interpretation of mortality figures in patients with acute upper gastrointestinal haemorrhage is made difficult by the difference in frequency of the causal lesions and the failure of many authors to define the cause and the presence or absence of other risk factors when quoting mortality rates. It is clear that patients may be divided into three groups:

1. Those with bleeding due to *peptic ulcer where the bleeding commenced prior to admission to hospital*, i.e. peptic ulcer patients, where acute stress ulcers have been excluded. This group may be further subdivided into three groups with different mortalities, i.e. chronic gastric ulcer, chronic duodenal ulcer and acute ulcer.

2. Those whose *bleeding commenced after admission to hospital*, i.e. acute stress ulcer. Here a high mortality may exist due to other severe physical disease, i.e. severe trauma, major medical illnesses, burns, etc.

3. Bleeding due to *oesophageal or gastric varices, carcinoma of the stomach and haematological diseases* (i.e. purpura, leukaemia, etc.). In this group, the mortality of the acute episode of bleeding is added to the mortality of the primary lesion, e.g. liver disease, cancer, etc.

### Mortality rates of haematemesis with time

For the purposes of this discussion, three time periods will be considered:

1. *Prior to World War II*, which covers the period when blood transfusion was not available and when the heterogeneous nature of the causal lesions was poorly defined.

2. *1940-1975* which coincides with the development of resuscitative procedures, the introduction of widespread use of modern diagnostic techniques, the selective use of surgery and a general availability of antibiotics and other measures widely used in the treatment of the severely ill. During this period, too, a large series of adequately diagnosed patients were presented which defined the risk factors associated with acute upper gastrointestinal haemorrhage, especially relating to peptic ulcer.

This period saw the developments in the acute medical and surgical management of bleeding varices, notably the use of vasopressin infusions, oesophageal balloon tamponade, emergency portosystemic shunts and transoesophageal varix ligation.

3. *1976-1983*. This encompasses the period which includes the best that has been possible in the diagnosis and treatment of acute upper gastrointestinal haemorrhage. These advances include the widespread use of fiberoptic endoscopy, the better definition of the role of surgery and the treatment of patients in sophisticated intensive care wards.

### Mortality due to upper gastrointestinal haemorrhage prior to 1940

These data have been summarized by Allan & Dykes (1976) and their, and additional, information is presented in Table 1.1. It is seen that the mortality rate varies between 1% and 22%. Mortality from

## 2 Gastrointestinal haemorrhage

**Table 1.1** Mortality from acute upper gastrointestinal haemorrhage 1900–1940

Author	Region	Period	Number of patients	Mortality rate (%)
Aitken (1934)	London	1929–1933	255	11
Bulmer (1932)	Birmingham	1902–1926	467	10
Burger & Hartfall (1934)	London	1921–1930	137	21
Chiesman (1932)	London	1925–1931	1812	10.8
Christiansen (1934)	Copenhagen	1923–1932	289	7.9
Cullinan & Price (1932)	London	1925–1929	109	18
Davies & Nevin (1934)	London	1924–1933	391	21.5
Hellier (1934)	Leeds	1926–1932	202	13
Hurst (1924)	London	1911–1920	600	2.5
Hurst & Ryle (1937)	London	1919–1935	371	1.1
Meulengracht (1935)	Copenhagen	1932–1936	251	1
Paterson (1924)	London	?–1924	1343	3.8

variceal haemorrhage was, however, considerably greater. Ratnoff & Patek (1942), in a series of 108 patients with bleeding varices treated prior to 1938, reported an immediate mortality of 33%, with 70% of patients dead within 12 months.

Data provided in Table 1.1 is limited by the failure of diagnostic facilities in that era to demarcate variceal from ulcer bleeding. This should not detract from the success of the series with low mortality because better diagnostic procedures would have demarcated the variceal group with its worse prognosis. The most common mortality rate is about 10%.

It is seen in three series in the period that there was a low mortality (3.8%, 1.1% and 1.0%). No reason is obvious for this apparent success.

### Mortality due to acute upper gastrointestinal haemorrhage 1940–1975

Data relevant to this period are summarized in Table 1.2. It is seen that the mortality rate in all series was less than 11% and usually 5–9%. In many series, the mortality in the peptic ulcer subgroup and the whole series can be obtained from the reports and if so, both mortalities are presented.

As well, several series of variceal bleeding were reported. Over this period, the mortality rates from variceal haemorrhage in seven series ranged from 45% to 84%: 76% by Higgins (1947), 83% by Atik & Simeone (1954), 59% by Nachlas et al (1955), 74% by Cohn & Blaisdell (1958), 45% by Taylor & Jontz (1959), 76% by Merigan et al (1960), 84% by Orloff (1962). Similar high mortality rates were achieved

with the use of either intravenous or intra-arterial vasopressin: 93% by Merigen et al (1962), 64% by Brant et al (1972), 77% by Conn et al (1972), 50% by Marubio et al (1972), 61% by Murray-Lyon et al (1973), 61% by Nussbaum et al (1974). Results with the use of balloon tamponade were equally disappointing: 47% by Reynolds et al (1952), 75% by Hamilton (1955), 82% by Conn (1958), 74% by Read et al (1960), 82% by Orloff (1962).

Orloff et al (1974) reported an early mortality rate of 52% in 115 consecutive patients undergoing emergency portacaval shunts, a similar figure to that obtained in an earlier series with transoesophageal varix ligation (46%) and substantially lower than the 83% observed in medically-treated patients (Orloff 1962). Other smaller studies support the finding of lower mortality in shunted patients, with an overall average mortality rate of 44% in 13 series summarized by Conn (1975). Interpretation of the results from these studies is complicated, however, by the considerable variation in mortality rates (23–71%) and by the presence of confounding variables such as heterogeneity regarding the aetiology of portal hypertension, the severity of liver disease and the precise timing of intervention.

### Mortality in recent series 1976–1983

These series have the advantage that the bleeding site has often been defined and the mortality defined in each diagnostic group. The data for the major series of acute upper gastrointestinal haemorrhage as a group and also where in some series the ulcer



Table 1.2 Mortality from acute gastrointestinal haemorrhage 1940-1975

Author	Region	Period	Number of patients	Mortality rate (%)
Allan & Dykes (1976)	Birmingham	1971-1973	300	9.7%
Banning et al (1965)	Essex	1960-1965	223	3%
Cates (1959)	Bristol	1953-1956	300	7%
			259	5%*
Cocks et al (1972)	London	1953-1962	1427	8.6%*
Coghill & Wilcox (1960)	London	1947-1958	325	13%
Cotton (1973)	London	1971-1972	208	3.8%
			109	3.7%
Duggan (1956)	Newcastle (Aus.)	1949-1954	363	8.3%
			219	8.7%
Fitzherbert & Epps (1950)	Sydney	1947-1949	124	7%
Fraenkel & Truelove (1955)	Oxford	1948-1952	377	5.6%*
Hellers & Ihre (1975)	Stockholm	1968-1969	149	20%
			131	11%*
Jones (1947)	London	1940-1947	530	8%*
Jones (1956)	London		1764	7.9%
Jones (1961)	London		534	4.1%*
Large (1960)	Reading		488	5.9%*
Lewin & Truelove (1949)	Oxford	1938-1947	305	19%
			252	17%*
MacCaig et al (1964)	London	1957-1960	559	7.7%*
Main (1964)	Falkirk	1952-1961	300	8.3%
			220	8.2%*
Needham & McConachie (1950)	Aberdeen	1941-1948	476	14%
Schiller et al (1970)	Oxford	1953-1967	2149	9%
Scott (1940)	Glasgow	1936-1940	110	13%
Smith (1945)	Glasgow	1934-1945	180	10%
Thomas & Rees (1954)	Swansea	1938-1942	160	11.8%
		1942-1951	218	8.7%
Walls et al (1971)	Leeds	1967-1970	165	8%
Ward-McQuaid et al (1960)	Mansfield	1963-1956	200	4.5%*
		1956-1958	200	8%*
Waterson (1956)	Cambridge	1950-1952	154	9.7%

\*Series restricted to peptic ulcer.

subgroup has been defined separately, are indicated in Table 1.3. Again, the mortality in most series, where all cases of acute upper gastrointestinal haemorrhage are considered as a single group, lies in the range of 6-12%. The new statistic to appear is a series where, when the bleeding is restricted to ulcer, the mortality is less than 2% (Hoare et al 1979, La Brooy et al 1979, Kang & Piper 1980). Series where the low mortality in bleeding peptic ulcer has been achieved deserve comment, as it could be asked why a low mortality is possible in these series and not in others.

1. La Brooy et al (1979), at Central Middlesex Hospital, London, reported 109 patients with haemorrhage not due to varices, stress ulcer or cancer and only 1 death occurred. The mean age was 58 years with a range of 20 to 87 years; 13 required surgery. This outstanding result was achieved in

patients who started to bleed prior to admission to hospital, without malignancy and without severe liver or renal disease and without severe exsanguination.

2. Hoare et al (1979) in Birmingham, England, reported 66 patients with peptic ulcer, all over 45 years, in a trial assessing the effect of cimetidine on bleeding. The latter had no effect. Patients with serious liver and renal disease were excluded, as were those with haemorrhage secondary to other major diseases. Emergency surgery was needed in seven patients.

3. Kang & Piper reported 184 patients with acute upper gastrointestinal haemorrhage in the period 1976-77, with 18 deaths (9.8%). If varices and cancer were excluded, the mortality was 5%. Of 148 with bleeding not due to varices, cancer or stress-related ulcer, only 3 deaths were observed (2%): of the 14

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**Table 1.3** Mortality from upper gastrointestinal haemorrhage due to ulcer since 1975

Author	Region	Period	Number of patients	Mortality rate (%)
Allan & Dykes (1976)	Birmingham	1970-1973	300	9.7%
Barer et al (1983)	Nottingham	1980	GU 186	11%*
		1982	DU 202	6%*
			Erosions 58	5%
			Other 230	6%
Brolin & Stremple (1982)	Pittsburgh	1973-1977	520	12%*
Brown et al (1981)	Bristol	1953-1956	287	5.5%*
		1974-1976	272	4.5%
Carstensen et al (1982)	Copenhagen	1977-1978	88	10%
Dawson et al (1982)	Birmingham	1981	151	6%
Dronfield et al (1977)	Nottingham	1976	322	10%
Gilbert et al (1979)	USA		800	9.4%
Himal et al (1978)	Montreal	1963-1971	630	12.5%
		1973-1976	334	6.7%
Hoare et al (1978)	Birmingham	1979	66	1.5%*
			100	1%
Hunt et al (1983)	Melbourne	1972-1977	Total 728	8.5%
			DU 225	6.2%*
			GU 76	13.1%*
			Varices 58	34.5%
			Acute 144	7.6%*
			Other 116	6.9%
			No diagnosis 98	2%
		1977-1982	Total 588	5.8%
			DU 219	2.7%*
			GU 113	6.2%*
			Varices 59	16.9%*
			Acute 55	1.8%*
			Other 126	4.8%
			No diagnosis 27	3.7%
Kang & Piper (1980)	Sydney	1976-1977	148	2%
Kittang et al (1982)	Oslo		90	0*
La Brooy et al (1979)	London	1979	101	1%*
Morgan et al (1977)	Keighley	1975-1976	66	11%
Siddiqui et al (1979)	Hartlepool	1979	113	8%
Vallon et al (1981)	London	1981	178	11%*
Vellacott et al (1982)	Nottingham	1975-1977	GU 173	13.9%*
		1978-1980	GU 225	12.9%*
		1975-1977	DU 224	9.4%*
		1978-1980	DU 260	9.8%*
Wetterfors et al (1982)	Linköping	1976-1980	367	10%
Wong et al (1980)	Hong Kong		467	6.4%*

\*Series restricted to peptic ulcer.

who started to bleed after admission, i.e. acute stress ulcers, 28% died.

The three units where these results have been obtained have only one feature in common — they are departments that have a long history of interest in the treatment of acute upper gastrointestinal haemorrhage and it is likely the good results reflect this interest and expertise. The role of special units available for the treatment of haematemesis and melaena has been emphasized by Hunt and his colleagues (1983).

The progress in the treatment of bleeding ulcer has not been as obvious when variceal bleeding is reviewed. Several studies since 1975, including some prospective controlled series, have again failed to show reduced mortality with the use of vasopressin infusions: 67% by Johnson & Widrich (1976), 49% by Kaufman et al (1977), 48% by Sherman et al (1979), 46% by Johnson et al (1977), 70% by Chojkier et al (1979). Fogel et al (1982) reported an in-hospital mortality rate of 45%, which was not influenced by randomization to intravenous vasopressin or placebo

therapy. Graham & Smith (1983), in a study of 85 patients with alcoholic cirrhosis and endoscopically proven bleeding varices, reported an early mortality in medically treated patients of 42% and, in a study by Kang & Piper (1980), 63% died in hospital. In one of the few studies examining the course of patients with variceal haemorrhage due to non-alcoholic liver disease, Tooouli et al (1983) reported a mortality of 63% in 8 patients undergoing emergency portacaval anastomosis. In an extension of previous studies, Orloff et al (1980) reported a 42% early mortality in 180 unselected cirrhotics undergoing shunts.

The old technique of endoscopic injection sclerotherapy has been reintroduced in recent years, and its efficacy has been reviewed (Allison 1983). In reported series of injection sclerotherapy for acute variceal haemorrhage, mortality rates ranging from 13% to 50% were observed: 13% by Denck (1971), 50% by Raschke & Paquet (1973), 16% by Johnston & Rodgers (1973), 39% by Terblanche et al (1981), 32% by Palani et al (1981), 21% by Barsoum et al (1982), 31% by Kjargaard et al (1982), 14% by Alwmark et al (1982).

In an 8-year (1972-1980) prospective study of 91 patients with bleeding varices, Hunt et al (1982) reported an overall in-hospital mortality rate of only 26%, falling to 18% in the latter 4-year period of the study. Subsequent data from the same unit, shown in Table 1.4, confirm this trend (Hunt et al 1983). The authors attribute these excellent results to adherence to a protocol which comprises early endoscopy, close medical-surgical liaison, management in an intensive therapy unit, extensive use of balloon tamponade and selective employment of decompressive surgery. This study, those of Orloff and his colleagues (1974) and those summarized by Allison (1983), provide

evidence that improved survival can be achieved in patients with variceal haemorrhage.

## *Has the mortality of acute upper gastrointestinal haemorrhage changed?*

### **Peptic ulcer**

A survey of the results of various series showed gross divergence in the mortality rates observed over periods of time. It is seen (Table 1.1-1.3) that a mortality rate for haematemesis overall is usually 8-10% and it could be claimed, therefore, that it has not changed. To state this is to ignore the fact that haematemesis is a disease of the elderly and in all communities the elderly population is increasing; it also ignores the different mortality associated with three common causes of bleeding, i.e. chronic ulcer, acute ulcer and varices. Kang & Piper (1980) have shown that, while there is little change in the overall acute upper gastrointestinal haemorrhage mortality rate in the published series in the English literature from 1939-1977, if the age-related mortality rates are plotted for non-variceal, non-cancer, non-stress-related ulcer groups, there is a marked reduction in the mortality of those over 60 years in the 12 published series where sufficient data were published to make the comparison possible (Fig. 1.1). Any change in the total series is obscured by the low mortality in the younger age group.

The second series of observations relevant to improved prognosis of acute upper gastrointestinal haemorrhage in the past decade originated from the detailed studies of Hunt and his colleagues (Hunt et al 1983).

**Table 1.4** Mortality rates due to acute upper gastrointestinal haemorrhage at Prince Henry's Hospital, Melbourne over two 5-year periods, 1972-1977 and 1977-1982, in relation to cause of bleeding (NS difference was not significant)

	1972-1977		1977-1982		Statistical comparison
	Cases	Deaths	Cases	Deaths	
Total	728	62 ( 8.5)	588	34 ( 5.8)	NS
Duodenal ulcer	225	14 ( 6.2)	219	6 ( 2.7)	NS
Gastric ulcer	76	10 (13.1)	113	7 ( 6.2)	p<0.05*
Oesophageal varices	58	20 (34.5)	59	10 (16.9)	NS
Erosive gastritis	144	11 ( 7.6)	55	1 ( 1.8)	NS
Mallory-Weiss syndrome	54	1 ( 1.8)	45	3 ( 6.6)	NS
Other causes	62	7 (11.3)	81	3 ( 3.6)	NS
No diagnosis	98	2 ( 2.0)	27	1 ( 3.7)	NS

\*For chronic peptic ulcer.

## 6 Gastrointestinal haemorrhage

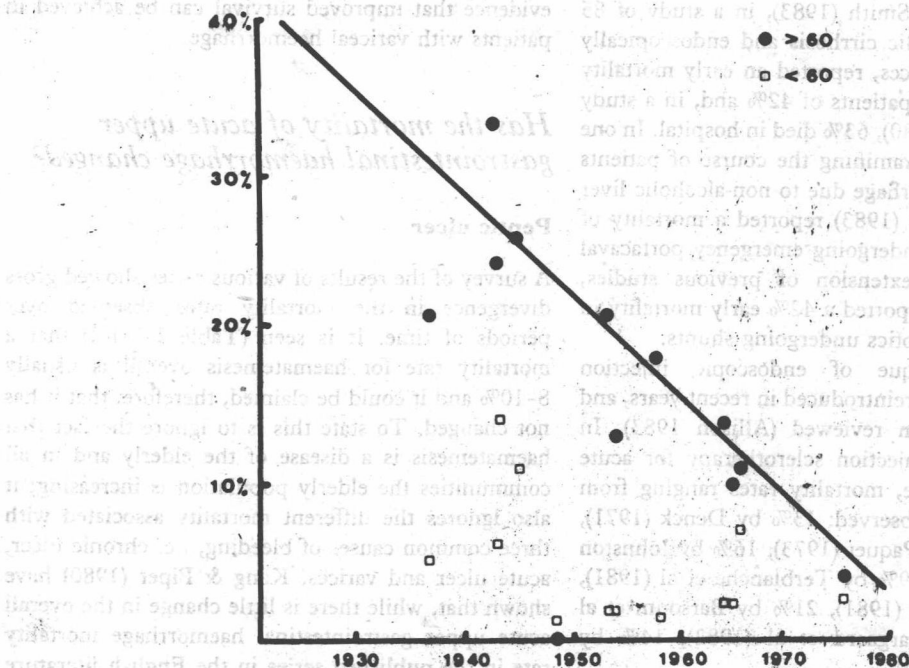


Fig. 1.1 Age-related mortality from selected series of acute upper gastrointestinal haemorrhage (due to ulcer excluding acute stress ulcer). (From Kang & Piper 1980).

728 patients in the period 1972–1977 were compared in each diagnostic group with 588 patients in the period 1977–1982. These results are shown in Table 1.4; it is seen there was an approximate halving of the mortality observed over the whole series and when patients with duodenal ulcer, gastric ulcer or oesophageal varices are considered separately. This drop reached statistical significance only in the gastric ulcer group. The improvement is attributed by the investigators to the establishment of a special unit devoted to the treatment of acute upper gastrointestinal haemorrhage, adequate resuscitation and a defined plan of management.

A similar trend in improvement in mortality with time was observed by Himal et al (1978) in Montreal, comparing two series treated in the periods 1963–1971 and 1973–1976. Using a more aggressive surgical approach in the latter group, it was observed there was a significant drop in overall mortality with time (12.5% versus 6.7% mortality). This drop was not present in the variceal group but only present in the ulcer group and in the total series.

Evidence that the mortality of ulcer has not changed is provided by the studies of Schiller et al

(1970) in Oxford. They studied 2149 emergency admissions because of haematemesis or melaena during 3 successive 5-year periods in the interval 1953–1967 inclusive. The fatality rate remained virtually constant throughout the period, in spite of changes in diagnostic measures and management. During this period, the age and sex distribution was similar and the chief diagnostic groups remained identical in size. The overall mortality rate was 8.9%.

The striking feature of the mortality of haematemesis and melaena is the marked variation observed in different series. This is obvious in the three time periods studied and no explanation is available that adequately accounts for this.

### Varices

Graham & Lacey, in reporting similar mortality rates in 1981 to those described in series published 27 and 30 years previously, concluded, 'it is apparent that we have learned much and accomplished little'. While the overall mortality from variceal haemorrhage appears to have altered little since the first substantive



report by Ratnoff & Patek in 1942, some investigations suggest improved survival with the use of portacaval anastomosis (Orloff et al 1980), injection sclerotherapy (reviewed by Allison 1983) or a protocol of intensive medical and surgical managements (Hunt et al 1982). We should be guided by studies such as these if any impact is to be made on the depressing mortality statistics relating to variceal haemorrhage.

### *Factors that could have been expected to produce a decline in mortality of acute upper gastrointestinal haemorrhage*

The benefit conferred by new measures has not been demonstrated statistically. Such studies are inhibited by the ethical problems associated with the relevant clinical trials and by the changing natures of the exposed population, the proportion of elderly increasing with their recognized higher mortality.

### **Advances in treatment of bleeding peptic ulcer**

These include

#### *Blood transfusion*

As Grossman et al (1950) have stated, there is no clinical trial data proving that blood transfusion decreases the mortality of haemorrhage from peptic ulcer. However, to deny its use, i.e. failure to transfuse a patient with oligaeamic shock, defeats the logic of medicine and physiology.

#### *Definition of risk factors resulting in death in patients with acute upper gastrointestinal haemorrhage due to peptic ulcer*

These were defined by Avery Jones (1947, 1956), Truelove and his colleagues (Schiller et al 1970) and Allan & Dykes (1976) and have been summarized by Balint (1977) (Table 1.5). Increasing risk is associated with:

**Table 1.5** Factors influencing mortality in patients with bleeding peptic ulcer (based on data reproduced, with thanks, from Balint J A et al 1977).

Factor	Mortality (%)
Type of ulcer	
chronic GU	16, 9.3
chronic DU	8, 5.6
acute ulcers	2.5
Age of patient	
<40	2.7
40-59	4.8
60-79	13.5
>80	17.9
Age of patient and type of ulcer	
chronic GU <60	13.0
>60	42.9
chronic DU <60	7.0
>60	44.0
acute ulcer <60	1.7
>60	22.5
Magnitude of bleed	
systolic BP	
>100 mmHg	8
80-99 mmHg	18
<80 mmHg	
Recurrence of bleeding	
single	5, 1.7
recurrent	10, 21.5
continuous	30

1. Chronic ulcer rather than acute, and chronic gastric ulcer has a higher mortality than chronic duodenal ulcer.
2. The age of the patient, mortality rising rapidly in those over 60 years.
3. Continued or recurrent bleeding.
4. Those with other serious disease.
5. The presence of persistent ulcer pain after admission.

Factors that do not influence the immediate mortality are the length of ulcer history and history of previous bleeding (Lewin & Truelove 1949).

As is seen from the above data, the patient who is over 60 years of age, has a chronic ulcer and who bleeds recurrently or continuously after admission is higher risk. Also in the high risk group is the person with acute ulcer associated with other serious disease, i.e. acute stress ulcer (Hubert et al 1980, Kang & Piper 1980). The definition of risk factors is relevant in that if more than one is present, the treatment of that patient in an intensive care ward of a major hospital is mandatory.

*Indications for emergency surgery*

Mindful of the factors that place the patient in the group with high risk of dying from bleeding, indications for surgery have been defined (Parsons & Aldridge 1951). These include:

1. Indications based on bad prognostic features mentioned above and includes the patients over 60 years of age with recurrent or, continuous bleeding and who have a chronic ulcer.

2. Those where the evidence indicates free bleeding from a large vessel with associated haemodynamic changes. This group of indications has been defined by Semb & Myren (1974) and includes:

- Fall in blood pressure greater than 50 mmHg or fall in central venous pressure of 5 cm H<sub>2</sub>O within 15 minutes.
- Fresh haematemesis or melaena greater than 600 ml per hour.
- Continuous bleeding requiring more than 4000 ml blood over 48 hours.

*Role of endoscopy in changes in mortality of bleeding peptic ulcer*

There are several studies that have shown that endoscopy as a procedure has not reduced the mortality rate of acute upper gastrointestinal haemorrhage (Dronfield et al 1977, Eastwood 1977, Graham 1980). A fall is not expected unless the information so obtained is used with profit in the utilization of the several therapeutic measures applicable to the control of bleeding. It is considered endoscopy serves an essential role in the management of the patient with acute upper gastrointestinal haemorrhage. Firstly, it enables a *definition of the bleeding lesion* which may influence immediate treatment, i.e. if a bleeding lesion is a varix and not an ulcer. Secondly, the demonstration of a chronic ulcer may provide one of the *indications for surgery* in the elderly patient who bleeds continuously or recurrently (qv). Thirdly, by the demonstration of an acute lesion, it may shorten the patient's stay in hospital. Fourthly, it may *show signs of recent haemorrhage* which will provide a guide to the risk of further bleeding. Fifthly, it allows the use of

*interventive techniques* such as photocoagulation or diathermy which may have a role in the haemostasis of actively bleeding ulcers (Swain et al 1981).

*Nasogastric suction*

This involves the passage of a nasogastric tube as soon as haemorrhage is suspected. The patient is placed on continuous suction and 100 ml water drunk each hour to facilitate aspiration. This serves the dual purpose of keeping the stomach free of blood clot and, more importantly, of detecting the presence of continuous or recurrent bleeding which, in appropriate circumstances, may constitute an indication for emergency surgery. It enables bleeding to be detected long before it is obvious from the haemodynamic changes as indicated by a rise in the pulse rate, a fall in blood pressure or central venous pressure. Most authorities recommend its use (Alexander Williams 1975, Chandler 1953, Wetterfors et al 1983). Gastric aspiration of blood also establishes the fact that melaena is due to upper gastrointestinal bleeding in a patient who has not vomited blood. In one study of the validity of this method in indicating gastroduodenal bleeding involving over 1000 patients, only 1% of patients with an upper gastrointestinal site of bleeding proximal to the ligament of Trietz had a gastric aspirate negative for blood and these were all duodenal ulcers (Luk et al 1979).

Unless it is causing marked discomfort to the patient, it should be left in place for 24 hours.

*Intensive care ward observation*

Every patient with proven or suspected acute upper gastrointestinal haemorrhage should be nursed in an intensive care ward for the first 48 hours at least. This environment enables careful observation of the patient's haemodynamic state. It is essential for the bad-risk patient. In this environment, central venous monitoring may be used.

*Central venous monitoring*

The nature of this assessment has been established by the work of Andersen (1970). He found this technique

was of value in detecting episodes of major arterial haemorrhage and as a guide to the patient's transfusion requirements. As in the case of blood transfusion, its value has not been assessed using double blind clinical trials.

## Advances in the treatment of bleeding varices

### Blood transfusion

Similar principles apply here as to peptic ulcer (qv). In addition, administration of clotting factors is a logical adjunct in patients with hepatic coagulopathy.

### Risk factors

Patients with bleeding varices may die from exsanguination, from the consequence of liver failure, such as encephalopathy or from sepsis. Logic, therefore, dictates that patients in Child's group C should fare worse than those in Child's group A or B. This seems to be borne out in most series (Olsson 1972). Other factors influencing survival have been described by Graham & Smith (1981). There is debate as to whether prognosis is better in patients with non-alcoholic liver disease than in those with alcoholic cirrhosis (Woodward & Webster 1972, Toouli et al 1983).

### Endoscopy

Haematemesis in patients known to have varices emanates from non-variceal sources in over one-third

of cases (Novis et al 1976). Hence early endoscopic assessment of the bleeding point is vital if rational therapy aimed at reducing mortality is to be undertaken. Injection sclerotherapy may be performed at the same time, if desired.

## Medical and surgical intervention

The contributions to the mortality rate of vasopressin administration, balloon tamponade, injection sclerotherapy and surgical intervention have been discussed in detail (qv).

### Intensive care ward observation

Similar principles apply as outlined for patients with bleeding peptic ulcer.

## Conclusion

Where valid data for comparison exist, there is evidence that the mortality of acute upper gastrointestinal haemorrhage from ulcers and varices has improved with time. This improvement has been predominantly in the ulcer group and here it has been restricted to those over 60 years of age. Moreover, this improvement has only been apparent in series from special units devoted to the care of acute upper gastrointestinal haemorrhage where full use is made of intensive care procedures and selective and skilled surgery.

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