ADVANCES IN THE BIOSCIENCES
Volume 32

GASTRIC CANCER

Editors:
J. W. L. FIELDING
C. E. NEWMAN
C. H. J. FORD
B. G. JONES

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Proceedings of the International Symposium on Gastric Cancer, Birmingham, 22-23 September 1980

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PREFACE

Information collected by the Birmingham Cancer Registry regarding cases of cancer of the stomach occurring in the West Midlands Region of England, from 1935 onwards, was analysed by a small group of us between 1960 and 1972. The results generally conformed with national statistics and showed that stomach cancer was the fourth commonest of all malignancies, that the overall 5-year cure rate was approximately 5%, and that during the period of study the cure rate was not improving.

As a preliminary step in efforts to try and improve the treatment of the condition, a small group of clinicians and statisticians (later calling itself the Birmingham Stomach Cancer Group) undertook a double blind trial to evaluate the possible value of chemotherapy in inoperable stomach cancer. During the 2-year study the group joined with workers from other centres and eventually a British Stomach Cancer Group was evolved. Following publication of that first study, a further large project to investigate the value of adjuvant chemotherapy in operable stomach cancer was undertaken, and the results of this will be published in the near future. In addition to information regarding cure rates, these studies produced much information regarding the incidence and natural history of the disease, factors affecting prognosis, and problems of treatment regimens.

Whilst our own results had not shown any great improvement, other centres, notably in Japan, had published significantly better results in early diagnosis and treatment. Other advances such as histological grading and tumour markers had been reported by other workers. In early 1980 the Birmingham Group felt that there would be considerable value in holding an International Symposium and gathering today's leading authorities in the investigation and treatment of stomach cancer to present and argue their views. This meeting was held in Birmingham on September 22 and 23, 1980.

We are grateful to the experts who travelled from a number of countries to take part in that Symposium. The total of their individual contributions was much enhanced by the stimulating discussions that followed the papers, and in which so many of the prime speakers were involved.

The group felt that the material presented in the papers and in the discussion afterwards would be of interest to many more than those who were able to attend

the meeting. For this purpose this book is being published, and our thanks are due to those who took part for allowing us to present their work. We would also express our gratitude to the commercial organisations whose financial aid did much to make the Symposium and the publication possible, and to the Special Trustees of the Central Birmingham District Endowment Fund for underwriting the costs of the meeting.

Finally, it must be recognised that much of the credit for the success of the venture was due to the enthusiasm and hard work of the organising committee of J. W. L. Fielding, B. G. Jones and C. E. Newman.

V. S. Brookes.

ACKNOWLEDGEMENTS

We wish to express our sincere thanks to the University of Birmingham for providing us with the facilities for the symposium and to Professor G. Slaney, Barling Professor of Surgery for his support and encouragement. We also thank the other members of the Stomach Cancer Group for their interest and support during the organisation of the conference.

This Symposium would not have been possible without the generous financial support we have received from Smith, Kline and French, Imperial Chemical Industries, Lundbeck Ltd., Bayer UK Ltd., the Upjohn Company, West Midlands Regional Health Authority, University of Birmingham and in particular the Special Trustees of the Queen Elizabeth Hospital.

We are indebted to Margot Morris, the Conference Coordinator, for her invaluable help with the organisation and running of the Symposium and with the editing of the book. Also to Mr. J.A. Griffin for recording the discussions and to our dedicated staff especially Joan Sharpe and Amanda Dorrell for their assistance during the meeting. Editing has been kept to a minimum to preserve the original style of the papers and atmosphere of the discussions and in order to expedite publication.

Finally, it is a pleasure to thank the publishers, Pergamon Press, for their help with the preparation of the book.

J.W.L. Fielding.
C.E. Newman.
C.H.J. Ford.
B.G. Jones.

CONTENTS

Changing Patterns in the Incidence of Gastric Cancer

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ABSTRACT

The gastric cancer death rates and incidence rates are still higher than any country in the world in Japan although both are on the steady decline in recent years. Calendar year effect was observed to be stronger than cohort effect in this tendency to decline. The reason for the recent decline in gastric cancer mortality in Japan is interpreted as a reflection of rather sudden dietary improvement in Japan, just as in other developed countries. Frequent intake of green-yellow vegetables, for instance, was noted to lower the gastric cancer risk both in smokers and non smokers. Cessation of smoking is recommended together with dietary improvement, in particular increased intake of vitamin A.

KEYWORDS

Gastric cancer; trend; green-yellow vegetables; cigarette smoking; Japan.

INTRODUCTION

In Japan, just as in most of other developed countries, the pattern of cancer has been changing rapidly in recent years. Cancer of the stomach and cervix have shown a steep downward trend, whereas cancers of the lung, pancreas, intestine, prostate, ovary, breast, urinary organs, and leukemia have been increasing steadily. One of the most impressive changes has been the decrease in gastric cancer mortality. Factors possibly related to the changing trend are reviewed.

MATERIALS AND METHODS

Vital statistics in Japan from 1955 to 1978 and results of the National Nutritional Survey from 1949 to 1978 provided the data for this presentation. Standard methods of both descriptive and analytic

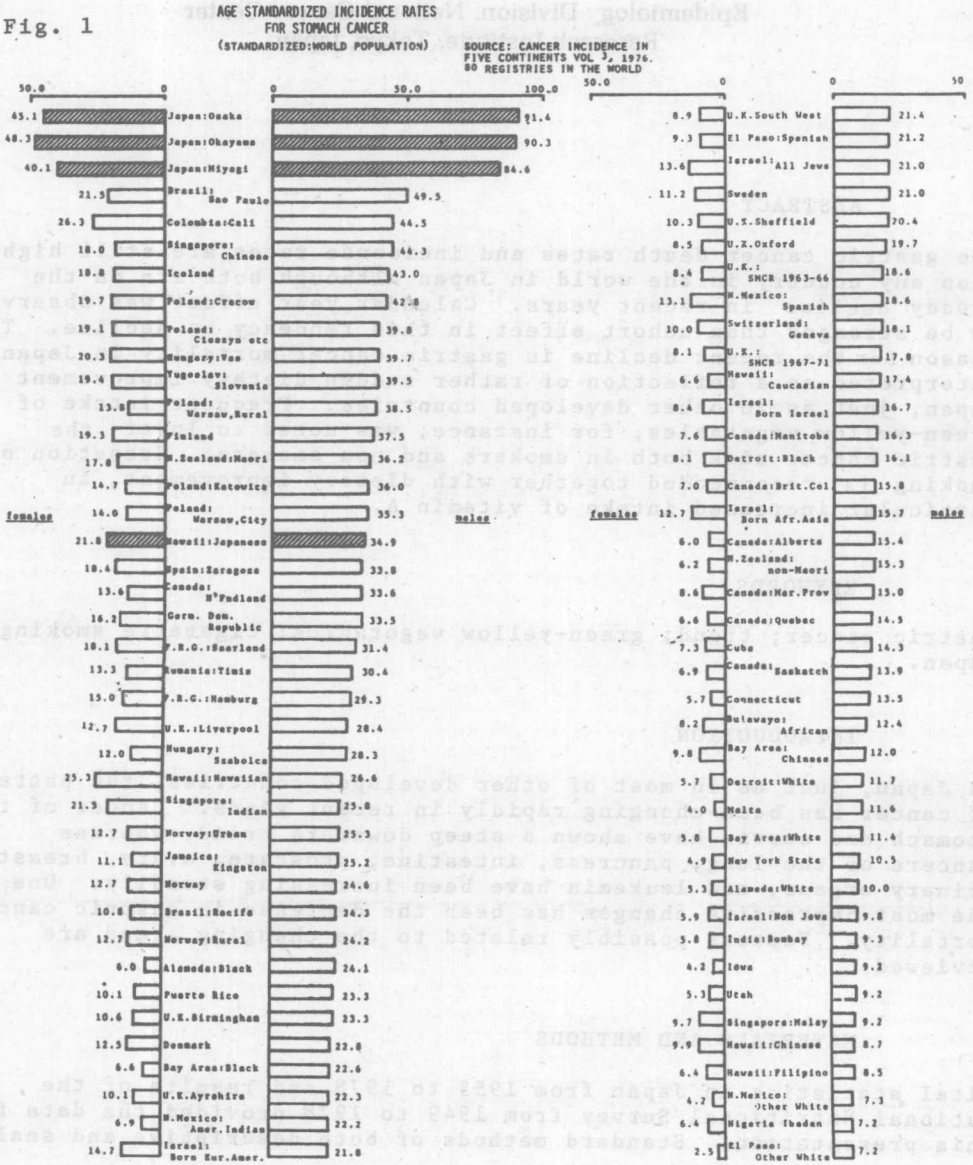
epidemiology were fully utilized in analyzing the data.

OBSERVATION AND DISCUSSION

1) International comparison:

Gastric cancer incidence rates are higher in Japan than any of cancer registries in the world. Japanese in Hawaii showed significantly lower incidence rate.(Fig. 1)

Fig. 1

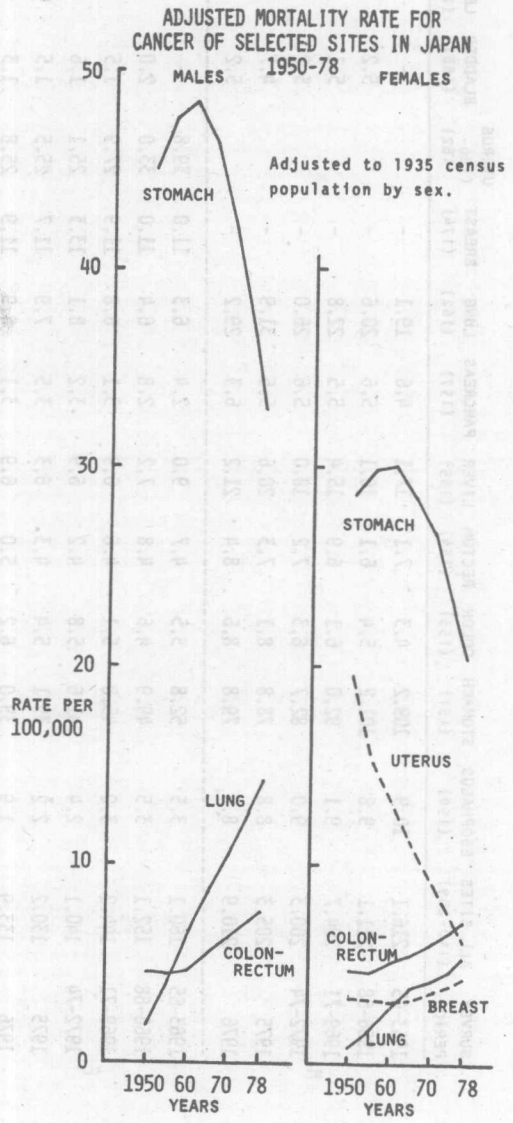


When compared with age specific incidence rates in USA, 10-20 fold increaseswere noted in younger age groups in Japan. The ratio became smaller with the advance of the age.

2) Trend in age adjusted death rates:

The age-adjusted death rates (adjusted to 1935 census population in Japan) for cancer of stomach show dramatic decrease both in males and in females in the last two decades. The steep decrease was also noted for cervical cancer. On the other hand, a sharp increase was observed for cancers of the lung, pancreas, prostate, urinary organs, colon-rectum, liver, breast, ovary, and leukemia.(Fig. 2)

Fig. 2



3) Trend in age adjusted incidence rates:

Similar trends have been observed in incidence rates in selected cancer registries. As shown in Table 1, 2 and 3, the slope of decline in mortality rates for gastric cancer in Osaka is slightly steeper than that in incidence rates in the same area.

Table 1

AGE-ADJUSTED INCIDENCE RATE
BY SELECTED PRIMARY SITE, SEX, AND SURVEY PERIOD
(/100,000 POPULATION, OSAKA)

	SURVEY PERIOD	ALL SITES (140-209)	ESOPHAGUS (150)	STOMACH (151)	COLON (153)	RECTUM (154)	LIVER (155)	PANCREAS (157)	LUNG (162)	BREAST (174)	UTERUS (180-182)	BLADDER (188)	LEUKEMIA (204-207)
M	1963-65	216.1	10.9	109.2	4.3	7.1	17.1	4.6	19.1	-		-	-
	1966-68	211.1	9.8	101.2	5.4	6.1	16.1	5.6	20.6	-		5.2	3.6
	1969-71	204.7	9.1	92.0	6.1	6.9	15.4	5.5	22.8	-		5.1	4.0
	1972-74	200.3	9.0	82.7	6.3	7.2	18.0	5.6	26.0	-		5.2	3.9
	1975	205.3	8.8	78.8	8.1	7.3	20.6	5.5	31.9	-		4.7	4.6
	1976	210.9	8.6	79.8	8.6	8.4	21.2	6.3	29.2	-		5.2	4.4
F	1963-65	160.1	3.5	52.8	3.5	4.7	9.0	2.4	6.3	11.0	39.8	-	-
	1966-68	152.1	3.5	49.9	4.6	4.8	7.2	2.8	6.4	11.0	33.0	2.0	2.6
	1969-71	144.2	3.0	45.8	5.1	4.6	6.9	3.1	6.8	11.9	27.9	1.5	3.1
	1972-74	140.1	2.4	41.6	5.8	4.2	6.9	3.2	8.1	13.3	25.1	1.6	3.0
	1975	130.2	2.2	39.1	5.4	4.3	6.3	3.5	7.9	11.7	25.5	1.5	3.8
	1976	133.9	1.9	39.0	6.2	5.0	6.9	3.1	8.9	11.9	25.8	1.3	3.4

Table 2

AGE-ADJUSTED MORTALITY RATES
BY SELECTED PRIMARY SITE, SEX, AND SURVEY PERIOD
(/100,000 POPULATION, OSAKA)

	SURVEY PERIOD	ALL SITES (140-209)	ESOPHAGUS (150)	STOMACH (151)	COLON (153)	RECTUM (154)	LIVER (155)	PANCREAS (157)	LUNG (162)	BREAST (174)	UTERUS (180-182)	BLADDER (188)	LEUKEMIA (204-207)
M	1963-65	162.5	9.4	82.6	3.3	5.3	-	4.2	15.0	-		3.0	2.9
	1966-68	160.3	8.2	74.0	3.6	4.5	-	5.0	17.2	-		2.3	3.3
	1969-71	154.8	8.3	69.6	4.7	5.0	14.3	4.9	18.6	-		2.4	3.5
	1972-74	157.3	8.1	65.4	4.3	5.6	16.0	5.1	22.0	-		2.9	3.4
	1975	159.3	7.8	60.1	5.6	5.6	18.0	5.0	26.6	-		2.6	4.2
	1976	158.7	8.3	58.0	5.5	5.8	19.0	5.5	25.0	-		2.4	3.9
F	1963-65	103.4	2.9	41.3	2.7	3.6	-	2.0	5.0	3.7	17.0	1.1	2.6
	1966-68	102.0	3.0	36.8	3.1	3.5	-	2.4	5.5	5.6	15.7	0.8	2.5
	1969-71	98.0	2.6	35.6	3.7	3.5	6.1	2.8	5.7	4.7	13.6	1.0	2.7
	1972-74	99.4	2.2	34.0	4.2	3.3	6.4	3.0	7.0	5.7	12.7	1.0	2.6
	1975	92.3	1.7	30.6	3.9	3.6	5.9	3.4	6.0	5.1	12.0	0.9	3.3
	1976	92.2	1.8	28.5	4.8	3.6	6.3	2.9	7.1	5.8	11.4	0.7	2.8

Table 3

PERCENTAGE CHANGE OF CANCER INCIDENCE AND MORTALITY RATES
BY SELECTED SITE AND SEX, OSAKA

PERCENT CHANGE OF RATES	ALL SITES (140-209)	ESOPHAGUS (150)	STOMACH (151)	COLON (153)	RECTUM (154)	LIVER (155)	PANCREAS (157)	LUNG (162)	BREAST (174)	UTERUS (180-182)	BLADDER (188)	LEUKEMIA (204-207)
M)												
INCIDENCE	- 2.4	- 21.1	- 26.9	100.0	18.3	24.0	37.0	52.9	-		-	-
MORTALITY	- 2.3	- 11.7	- 29.8	66.7	9.4	-	31.0	66.7	-		- 20.0	34.5
F)												
INCIDENCE	- 16.4	- 45.7	- 26.1	77.1	6.4	- 23.3	29.2	41.3	8.2	- 35.2	-	-
MORTALITY	- 10.8	- 37.9	- 31.0	77.8	0	-	45.0	42.0	56.8	- 32.9	- 36.4	7.7

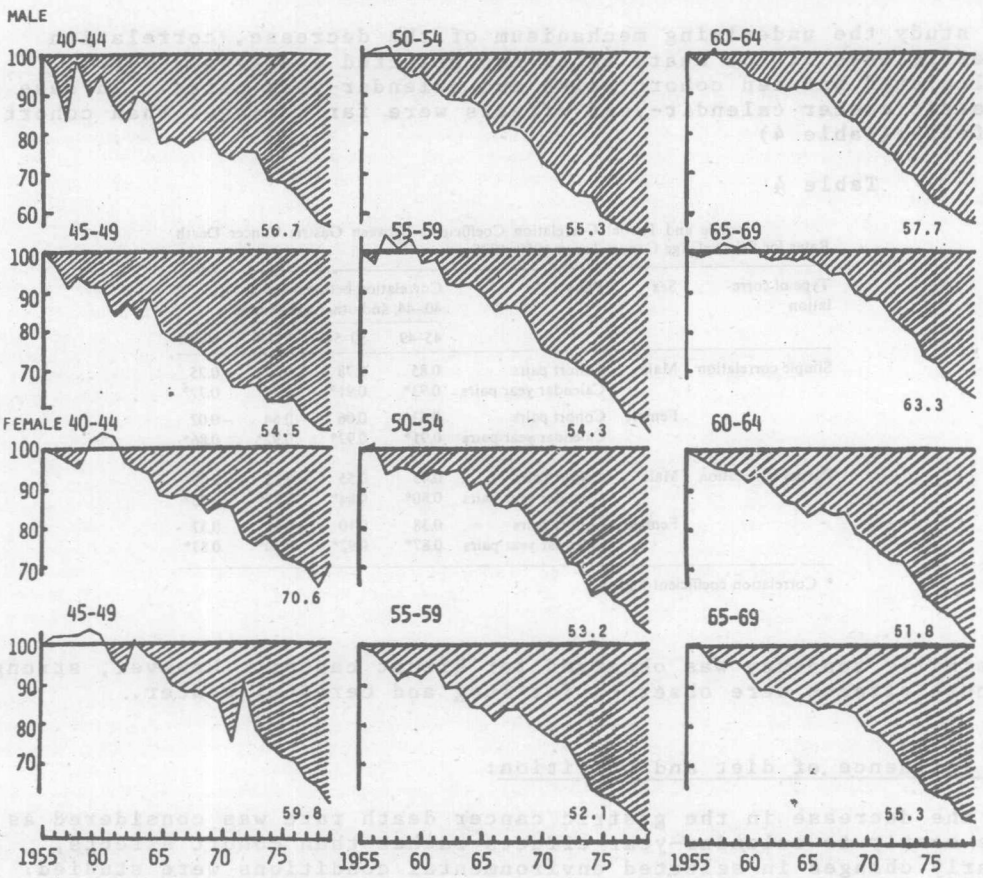
$$\text{PERCENT CHANGE OF INCIDENCE AND MORTALITY RATES} = \frac{\text{RATE FOR 1976} - \text{RATE FOR 1963-65}}{\text{RATE FOR 1963-65}} \times 100$$

4) Trends in age specific death rates:

The age-specific death rate for gastric cancer has been declining since 1955.(Fig. 3)

Fig. 3

ANNUAL TREND OF AGE SPECIFIC DEATH RATE
FOR STOMACH CANCER IN JAPAN (1955-1979)



Among males, the death rate in 1978 in the 40-44 age groups was 43% lower than it was in 1955. The proportion of decline was 46%, 45%, 46%, 42%, and 37% for the age groups 45-49, 50-54, 55-59, 60-64, and 65-69, respectively. In females, the proportion decline was 29%, 40%, 47%, 48%, 48%, and 45% for the age groups 40-44, 45-49, 50-54, 55-59, 60-64, and 65-69, respectively.