The waiting time paradox: population based retrospective study of treatment delay and survival of women with endometrial cancer in Scotland

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Delay in the delivery of treatment for gynaecological cancers has been previously investigated.[1 2] In some cases, the delay reflects the illness behaviour of women; in others, it was inherent in the system for delivering health care. Few studies have linked delay in treatment with survival, although a study from Israel found that survival from endometrial cancer was not affected by a delay in treatment of four months.[3]

We investigated links between delays in treatment and survival, using a recently completed audit of endometrial cancer treatment in Scotland.

Methods and results

We collected data from the case notes of all women resident in Scotland who were diagnosed between 1 January 1996 and 31 December 1997 as having endometrial carcinoma. Of 781 cases, we found case notes for 714, and, out of these, we analysed the 703 cases that involved operative treatment.

We calculated time intervals from the dates of general practitioner referral letters, clinic appointments, investigations, and operations. We allocated an International Federation of Gynaecology and Obstetrics (FIGO) stage to each case retrospectively[4]; we then categorised cases by FIGO stage.[5] We linked these data to survival information from ISD-Scotland and did a univariate analysis using the Kaplan-Meier method and multivariate analysis using Cox's proportional hazards analysis.

Delay and survival were inversely related: women with the shortest delay had more advanced disease and survival was least likely for these patients (table). This trend is seen most starkly in the delay from general practitioner referral to first hospital visit.

Interval from general practitioner referral to surgery and survival

	No	Hazard ratio (95% CI)	
		Univariate analysis	Multivariate analysis
GP to surgery interval:			
<40 days	154	1	1
40-61 days	155	0.50 (0.30 to 0.82)	0.71 (0.43 to 1.19)
62-91 days	155	0.34 (0.19 to 0.59)	0.47 (0.27 to 0.83)
>92 days	153	0.39 (0.23 to 0.67)	0.53 (0.30 to 0.93)
Age:			
<60 years	135	1	1
⩾60 years	545	1.83 (1.06 to 3.16)	1.28 (0.72 to 2.30)
FIGO stage category:			
1AG1 and 1BG1 (low risk)	182	1	1
1AG2/3, 1BG2/3, and 1CG1/2 (intermediate risk)	289	3.11 (1.38 to 7.01)	2.8 (1.15 to 6.85)
1CG3, stages 2/3/4 (high risk)	182	12.8 (5.9 to 27.9)	11.1 (4.74 to 25.8)
Cannot be assigned to case	50	5.8 (2.2 to 15.2)	5.2 (1.85 to 14.7)
Adjuvant radiotherapy:			
Yes	275	1	1
No	428	0.83 (0.57 to 1.19)	2.00 (1.29 to 3.11)

The median interval from referral to definitive operation was 62 days (90th centile 150 days). Large variations between health board areas existed: the median interval from referral to definitive operation varied from 46 to 81 days (74 to 287 days).

Comment

The interaction between survival and delay in treatment is complex: we found that patients who experience the longest delay in treatment are more likely to survive. This is paradoxical: it is popularly assumed that delay has a significant and harmful impact on survival.

This interaction is partially accounted for by the relation between stage and delay but is only partly explained by the FIGO stage category in a Cox proportional hazards model corrected for age, stage, and use of radiotherapy.

The traditional view is that delay caused by organisational defects has an adverse effect on the disease: this influences survival. Our study suggests that disease influences delay, and so delay is a confounding factor.

The fact that the strongest effect between delay and survival is seen in the interval between referral and the first hospital visit suggests that general practitioners communicate information related to presentation in some way to consultants. This communication ensures that consultants respond faster to patients who are at higher risk. Consultants seem to be able, from first clinic visit, to differentiate patients at greater risk and to ensure that cancer is diagnosed and treated faster. Women with the longest delays have the best survival, and vice versa, suggesting that the "healing art" remains an important but elusive factor.

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