

Survival time after surgery is inversely related to the amounts of prostaglandins extracted from human breast cancers

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Homogenates of malignant human breast tumours contained more prostaglandin-like material (PG-lm) than those of benign tumours or apparently normal breast tissue (Bennett, Charlier, McDonald, Simpson, Stamford & Zebro, 1977). Patients whose malignant tumours produced highest amounts of PG-lm most frequently had scintigraphic evidence of bone metastases at the time of surgery, and 'basal' amounts of PGs tended to be higher in tumours with histological evidence of invasiveness (Bennett *et al.*, 1977). We now show that patients whose tumours produced most PG-lm often die soonest after mastectomy.

Tumours were removed at operation and samples were homogenised in acid-ethanol to indicate 'basal' amounts of PG, or in Krebs solution which allows synthesis from released endogenous precursors ('newly synthesised' + 'basal' = 'total' PG). The PGs were extracted and bioassayed against authentic PGE_2 on the rat stomach strip preparation (Bennett

et al., 1977). Survival time after operation was measured to the nearest month.

In 25 women aged 42-87 years (median 60) at the time of operation who died 1.5-36 months later, higher amounts of tumour PG-lm correlated significantly with early death (Table 1). In another analysis the results of these patients were combined with those of three dead patients whose tumours were examined only for 'total' PG, and 92 others still alive aged 28-96 years (median 54) at the time of surgery. Tumour PGs were compared in those living at least 6 months with those living less than 6 months, and similar comparisons were made at 12, 18 and 24 months. In patients dead at the end of each period the median tumour PG-lm always tended to be higher than in tumours from patients still alive. The differences with basal and total PG-lm in dead and alive patients were often statistically significant, but newly synthesised PG was significantly different only at 12 months (Table 1).

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Reference

BENNETT, A., CHARLIER, E.M., McDONALD, A.M., SIMPSON, J.S., STAMFORD, I.F. & ZEBRO, T. (1977). Prostaglandins and breast cancer. *Lancet*, 2, 624-626.

Table 1 PGs extracted from breast cancers. The values are medians with semi-quartile ranges in brackets. Top line, tumours from patients now dead; higher amounts of total, basal and synthesised PG-lm correlated significantly with early death (Spearman correlation). The rest of the table compares PG-lm obtained with tumours from patients living as long as, or more than, the time shown (Mann-Whitney U test). n = the number of patients. $P < 0.1^*$, $<0.05^{**}$, $<0.01^{***}$

Survival (months)	n	Total	n	ng PGE_2 equivalents/g tumour Basal	n	Synthesised
15(7.5-23)	25	53(10-130)***	25	19(4-63)***	25	21(7-119)**
6 or less	5	210(54-250)	5	63(28-170)	5	147(-116-232)
> 6	115	42(16-80)**	95	12(4-28)***	95	22(9-51)
12 or less	11	120(80-250)	10	55(19-140)	10	128(35-260)
> 12	109	40(14-80)***	92	11(3-27)***	92	22(8-47)***
18 or less	17	88(18-210)	16	19(4-63)	16	39(7-147)
> 18	83	43(16-80)	70	12(4-32)	70	22(10-43)
24 or less	23	88(39-130)	20	19(4-63)	20	34(8-119)
> 24	48	42(16-75)**	40	10(3-32)*	40	22(9-51)