

## INCIDENCE AND OUTCOME OF MALIGNANCY IN PATIENTS ON A DIALYSIS PROGRAMME

E Riembau, J Roma, E Marcuello, \*J Aubía, \*J Lloveras,  
\*J Masramón, †J Torrents, \*\*E Rius

*Hospital General de Mollet, \*Hospital General M.D. de l'Esperanca, Barcelona, †Hospital General d'Igualada, \*\*Hospital de Santa Tecla, Tarragona, Spain*

### Summary

The incidence of malignancy observed in a group of 404 patients on a dialysis programme for an average of 34.2 months was compared to that expected for an homogeneous group of the Spanish population. Eleven neoplasms (1 kidney, 1 prostate, 1 bladder, 1 mixoid liposarcoma, 1 lung, 1 ovary, 1 lymphoma, 1 vulva, 2 gastric, 1 colon) were diagnosed. The incidence is 2.26 times higher than expected. Six patients received anti-neoplastic therapy and nine died – seven due to cancer, two due to therapy complications – 9.22 months after diagnosis.

### Introduction

Following the report [1] of an increased incidence of malignancy in uraemic patients seven times greater than expected, further studies have given controversial results. The heterogeneity of the patient group selection, the incidence of malignancy in the non-uraemic population related to the geographic area and the distribution of age groups might explain such a disparity of results. In our study we observed an increase in the incidence of malignancies in relation to that expected for a group of 404 patients on a dialysis programme.

### Material and methods

We studied 404 patients on dialysis from four hospitals in Catalunya, Spain. They were examined from May 1978 until December 1984 and they underwent either haemodialysis and/or intermittent peritoneal dialysis and/or continuous ambulatory peritoneal dialysis (CAPD). Sex distribution was 224 males and 180 females and the average age at onset of dialysis was  $51.7 \pm 11.8$  years (range 10–78). Time on dialysis until transplantation, death or the end of the study, averaged  $34.2 \pm 23.5$  months (range 3–85). We excluded malignancies diagnosed before the onset of dialysis, those which appeared during the first three months and those diagnosed in patients who had previously received immunosuppression.

The incidence of malignancy in this population at risk, excluding skin cancers, was compared with the incidence in a non-uraemic general population of the same age distribution, during the same time of risk exposure and according to statistical data from two geographic areas adjacent to ours [2]. We calculated the malignancies expected for this group and compared them with the malignancies observed in our group of dialysis patients. The influence of the treatment on survival was also examined.

## Results

Eleven neoplasms were diagnosed in 11 patients (7 males, 4 females). Sex, cause of renal failure, malignancy diagnosis and its extension, neoplastic treatment, death related to treatment and survival rate from diagnosis are individually detailed in Table I.

The average age of these patients was  $56.7 \pm 13.7$  years (range 32–72), the average time on dialysis was  $37.9 \pm 21.5$  months (range 4–76) and the average time on dialysis until malignancy diagnosis was  $28.1 \pm 22.6$  months (range 3–54). According to the incidence of malignancy in the general population in our country [2], the malignancies expected for a population group with the same age and sex distribution and the same time of exposure (34.2 months) was 4.86 cases. The diagnosis of 11 malignancies among our dialysis patients during the period gives an incidence 2.26 times higher than that expected for the general population.

The extent of malignancies when diagnosed was localized in three cases, regional in two cases and metastatic in six cases. In three cases, surgical excision of the primary tumour was performed; in another two cases chemotherapy was included; and in one case radiotherapy was the only treatment. In four cases, treatment was not considered because the age of the patients and/or the extent of malignancy. In one case, the diagnosis of primary malignancy was obtained at necropsy.

Nine of the 11 patients died between one and 22 months (average  $9.22 \pm 6.78$ ) after the diagnosis of malignancy. Seven died from cancer and two from therapy complications (1 *Candida* sepsis after chemotherapy and 1 after thoracotomy for a pleural metastatic effusion). The two other patients are alive eight and 17 months (average 12.5 months) respectively after diagnosis. Both were treated for the primary tumour.

## Discussion

The incidence of malignancy in uraemic patients has been extensively discussed as the heterogeneity of the different groups of patients studied has created results which have not only been diverse, but also contradictory. Our observation of an incidence 2.26 times greater than that expected is similar to that noted by Herr [3] (3.8 times higher for 499 dialysis patients), and Lindner [4] (2.5 times higher for 148 dialysis patients). EDTA data [5] report an incidence of 8.5 malignancies per 1000 dialysis patients, but comparison has not been

TABLE I. Diagnosis and outcome of neoplastic dialysis patients observed

Patient	Sex	Nephropathy	Malignancy	Extension	Treatment	Outcome	Death related to therapy	Survival (months)
1	M	Gout nephritis	Kidney ADC	Loc	Surgery	Dead	No	16
2	M	Gout nephritis	Prostate ADC	Met	Surg + Chem	Dead	No	22
3	M	Nephrosclerosis	Bladder, squamous	Loc	Surg + Chem	Dead	Yes	4
4	M	Polycystic	Gastric ADC	Met	-	Dead	-	7
5	F	Polycystic	Mixoid liposarcoma	Met	Radiotherapy	Alive	-	(17)
6	M	Nephrosclerosis	Lung 'oat cell'	Reg	-	Dead	-	1
7	F	Pyelonephritis	Ovary ADC	Met	-	Dead	Yes	9
8	F	Nephrosclerosis	Lymphocytic lymphoma	Met	-	Dead	-	6
9	M	Pyelonephritis	Gastric ADC	Loc	Surgery	Dead	No	15
10	F	Nephrosclerosis	Vulva, squamous	Reg	-	Dead	-	3
11	M	Pyelonephritis	Colon ADC	Met	Surgery	Alive	-	(8)

M=male; F=female; ADC=adenocarcinoma; Loc=localized; Met=metastatic; Reg=regional; Surg=surgery; Chem=chemotherapy

possible with a comparable general European population. Studies similar to ours include exclusively uraemic patients on dialysis programmes. We also excluded skin neoplasms, those which appeared in patients previously treated with immunosuppression or those diagnosed during the first three months of dialysis. On the other hand, the average age of our dialysis patients was similar to the average age of our neoplastic dialysis patients.

Both Slifkin [6] and Bush [7], who disagree with this increase in the incidence of malignancies, reported important differences of age between the average age of uraemic patients at risk and that of the uraemic neoplastic patients. Moreover, Bush's population at risk involved uraemic patients who were or were not included on a dialysis programme. Therefore we believe that the characteristics of the different geographic areas, the homogeneity of the studied patients and, above all, the average age of the dialysis patients matched with that of the general population at risk, are decisive factors in the incidence of malignancy in dialysis patients.

The role of nitrogenous substances as precursors of carcinogenic substances, the chromosome aberrations of the dialysis patients or the association of some nephropathies with some urinary tract neoplasms might justify [8] this higher incidence. In our series, the elevated number of malignancies localized in the urinary tract may be related to the long-term evolution of the nephropathies of the affected patients. On the other hand, the localization of the tumours of our dialysis patients are similar to those of higher frequency in the general Spanish population, except for the absence of breast tumours in our four neoplastic women.

The 1980 EDTA data show a survival rate of the neoplastic dialysis patients of 32 per cent at 24 months; we found a survival rate of 45.5 per cent at 12 months. But in 1976 the USA Public Health Service [9] gave a survival rate of 41 per cent at five years for all neoplastic patients in the general population, excluding skin and cervical cancers. None of the deaths among our neoplastic dialysis patients was due to other causes than cancer. This difference of prognosis with the USA general population might be explained by the different extents of malignancy at diagnosis. While the American Cancer Society [10] observe that 35.7 per cent of the cancers (skin and cervical excluded) are diagnosed with metastasis or when surgery is not considered, we found that 54.5 per cent of our neoplastic patients were diagnosed with metastasis. Therefore, in only six of our 11 neoplastic patients was some kind of anti-neoplastic treatment carried out. Surgery to the primary tumour, performed in five cases, extended survival in four of them over 12 months. On the other hand, one of the two patients treated with chemotherapy died of *Candida* sepsis. We believe that an early diagnosis and surgery of the primary tumour increases the survival rate of the patients. Chemotherapy may add further risks to the low survival rate of the malignancies diagnosed in patients on a dialysis programme.

## References

- 1 Matas A, Simmons R, Kjellstrand CM et al. *Lancet* 1975; i: 883
- 2 Vines J, Zubiri A. In Waterhouse J, Muir C, Shanmugaratnam K et al, eds. *Cancer Incidence in Five Continents*. Lyon: IARC Scientific Publications. 1982: 526–529 and 530–533
- 3 Herr HW, Engen DE, Hostetter J. *J Urol* 1979; 121: 584
- 4 Lindner A, Farewell VT, Sherrard DJ. *Nephron* 1981; 27: 292
- 5 Jacobs C, Brunner FP, Brynger H et al. *Transplant Proc* 1981; 13: 729
- 6 Slifkin RF, Golberg J, Neff MS et al. *Trans ASAIO* 1977; 23: 34
- 7 Bush A, Gabriel R. *Clin Nephrol* 1984; 22: 77
- 8 Kjellstrand CM, Matas A, Cosio F et al. *Proceedings 8th International Congress of Nephrology, Athens*. 1981: 1217–1222
- 9 Axtell LM, Asire AJ, Myers MH, eds. *Cancer Patient Survival, Report No 5, Cancer Surveillance, Epidemiology and End Results Program*. National Cancer Institute, NIH, USDHEW Publ. 1976: 77–992
- 10 American Cancer Society. *Cancer Facts and Figures*. New York: American Cancer Society. 1977