Hemodialysis and Cancer

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Dear Sir,

Yanagisawa and Wada [1] recently reported a significant increase in carcinogenic heterocyclic amines in the plasma of patients with uremia just before induction of hemodialysis (HD) treatment. Uremic patients receiving maintenance HD treatment showed lower levels of those compounds and it could not be detected in normal subjects. Several reports have shown the patients with chronic renal failure exhibit a higher incidence of malignancy [2–5] and a hypothetical relationship can be suggested.

We reviewed the incidence of malignancies among patients treated with chronic HD in our center between 1977 and 1988. 474 patients were investigated and malignant neoplasms were diagnosed in 20 cases (4.21%). This indicates a 2.76 times greater risk of suffering from cancer than the general population at the same age [6]. 14 patients were males (4.6% of males treated with HD) and 6 were females (3.4% of females treated with HD). The mean age of the patients was 56.2 ± 12.0 years, 9 (45%) of the diagnosed cases were older than 60 years. The age at which the neoplasm was discovered was lower in women than in men (47.6 ± 15.6 vs. 59.8 ± 8.2 years; $p < 0.005$), with 3 cases younger than 40 years (50%) versus none of the men. Six cases (30%) were diagnosed just before starting HD treatment, 2 more cases were detected less than 6 months after induction of HD treatment, and the rest ($n = 12$) a long time after beginning dialysis. In 7 (35%) patients the malignancy was detected when the patient had been on HD for more than 5 years. The mean time of uremia before the diagnosis of neoplasm was 51.2 ± 38.4 months (2–140 months) and the mean time of treatment with dialysis before detection of cancer was 52.7 ± 37.6 months (5–126 months).

Other authors have observed that most of the neoplasms diagnosed in their series were found in the early phase after the induction of HD treatment [4, 5]. It is possible that the novice agent works during the period of uremia and it disappears or decreases after HD treatment has begun. Our data also suggest that the agent could persist a long time after HD treatment has been induced, perhaps at a lower concentration, and it could produce the same effect some years later. Several factors could be involved in the pathogenesis of the increased incidence of cancer in uremia [2, 3, 7, 8]: T-lymphocyte dysfunction; acquired renal cystic disease; etiology of chronic renal failure; the extracorporeal elements used in HD, and increased concentrations of nitrosamines in natural water, among others. Until now, no clear demonstration of the involvement of one or more of these factors has been offered. Especially, T-lymphocyte and natural killer activity have been suggested to play an important role in this item [7, 9], but HD

treatment does not enhance cellular immunity at all [9] and so, this hypothesis cannot be supported by our data.

The work of Yanagisawa and Wade [1] suggests an interesting hypothesis to explain the high incidence of cancer around the moment of induction of HD treatment in our patients. We have not assayed the level of those compounds in the plasma of our patients but the close correlation in time is very suspicious. Obviously, we cannot be sure that the increase in heterocyclic amines is the real cause of all malignancies in HD, but it could be one of the main factors in its pathogenesis, especially when the neoplasm is diagnosed around the time of starting HD treatment. Wider and more documented studies are warranted to understand the true importance of this problem.

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