COMPARATIVE STUDIES ON URAEMIC ANAEMIA IN POLYCYSTIC KIDNEY DISEASE AND IN OTHER RENAL DISEASES

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The clinical observation of uraemic patients gave us the impression that anaemia in polycystic kidney disease is less pronounced than in other renal disease. This impression prompted us to review the data of 43 patients with renal insufficiency due to polycystic kidney disease (Group 1) and of 70 patients with chronic renal insufficiency due to glomerulonephritis, pyelonephritis and nephrosclerosis (Group 2). Red cell counts of the two groups were compared with respect to the creatinine level (Fig. 1).

The review included only patients hospitalized in the last three years who were known to have a long lasting renal insufficiency and had been for at least one month on the special low protein diet previously described (Monasterio *et al.*, 1964). They had not received blood transfusion in the two months preceding the collection of the data and were not presenting any detectable blood loss. Furthermore, in none of them was there clinical evidence of dehydration, exacerbation of the underlying renal disease, gross infection of urinary tract, and other illness besides the renal disease. Figure 2 shows the regression lines of the two groups; the well known trend (Roscoe, 1952; Kaye, 1958, Verel *et al.*, 1959) for the anaemia to become more severe with increasing creatinine levels is much more evident in Group 2 than in Group 1; statistical comparison of the slope of the two regression lines gave a highly significant difference ($P < 0.001$).

Consistent with these findings is the behaviour of two uraemic patients with polycystic kidney disease who presented during one year of chronic dialysis treatment a haematocrit ranging from 30 to 35% although blood transfusion averaged as little as 0.5 unit per month. This behaviour should be compared with that of 8 uraemic patients of group 2 who, for

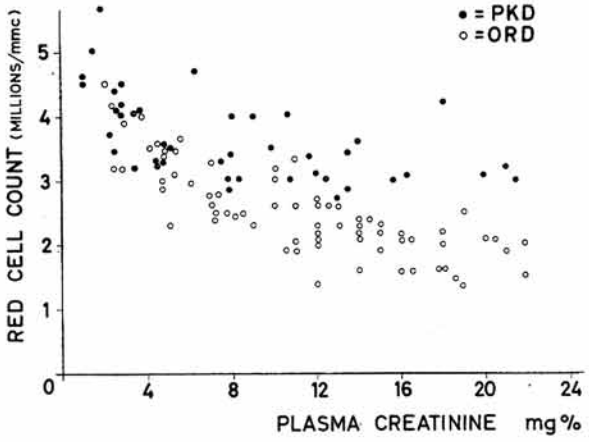

Fig. 1

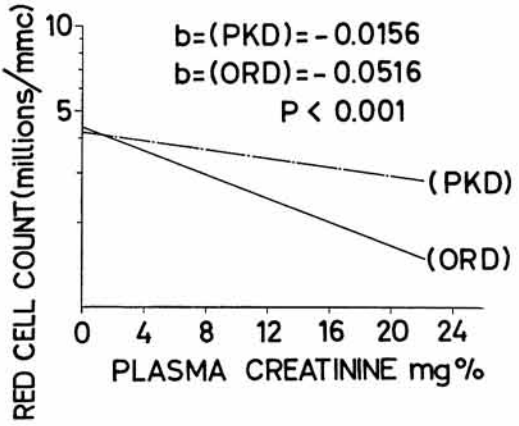

Fig. 2

about the same period of time, presented a minimum blood requirement of 2 units per month and a haematocrit value ranging from 21 to 26.

To gain a better insight into these findings studies of reticulocyte count, bone marrow smear and erythrokinetics were performed on two groups of patients matched for plasma creatinine level.

Reticulocyte count and myeloid erythroid ratio were determined, respectively, in 15 patients of Group 1 and 15 patients of Group 2 with plasma creatinine levels ranging from 11 to 21 mg%. It is readily apparent from Figure 3 that erythropoiesis in Group 1 is at a higher level than in Group 2, the difference being statistically significant ($P < 0.001$).

Erythrokinetics were studied in 6 uraemic patients of each group. The erythroid iron turnover ranged in polycystic patients from 0.51 to 0.69, the mean value being 0.60 mg per 100 ml of blood per day. In the other group this parameter ranged from 0.20 to 0.69 with a mean value of 0.43, which is similar to that reported in uraemic patients by several investigators. (Kuroyanagi, 1961; Mann *et al.*, 1965; Kurtides *et al.*, 1964; Kaye, 1958). The plasma iron turnover and the percent iron utilization by red cells showed a similar behaviour.

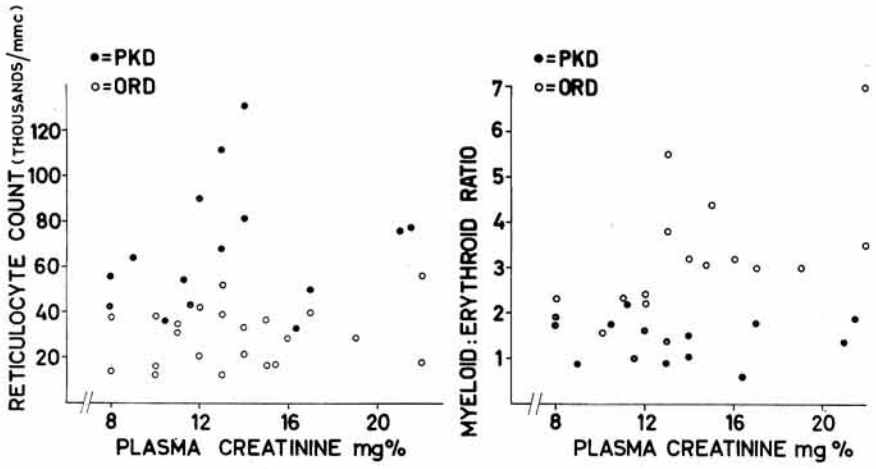

Fig. 3

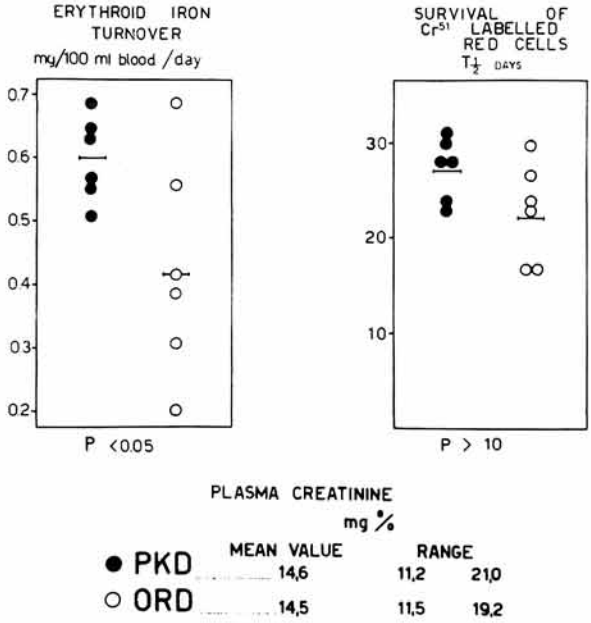

Fig. 4. Erythrokinetic data.

In none of these patients was found a gross haemolysis, the Cr^{51} tagged red cell survival being moderately reduced in only two patients of Group 2 and normal or slightly shortened in the others. The slight difference between the two groups in the red cell survival is not statistically significant (Fig. 4).

These preliminary results justify the belief that the uraemic anemia of polycystic kidney disease is less severe than in other renal conditions, the difference being due to a more sustained erythropoiesis.

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