Progressive renal failure is the most frequent complication of autosomal dominant polycystic kidney disease (ADPKD). In 1957 Dalgaard [1] showed that among his population of 346 affected patients, only 55% had end-stage renal disease (ESRD) by the age of 50 years and 70% by the age of 70. One of these patients died before ESRD at 96 years of age. This work was the first to underline the possibility of benign evolutive forms, so considered because ESRD or death occurred at an age over 65 years. During the last decade, other clinical studies have been published [2-7], confirming the results of Dalgaard [1] and suggesting that male gender is a risk factor for the unfavorable prognosis of ADPKD [6, 7]. In a retrospective study, we studied the prognosis of ADPKD in affected subjects from 297 kindreds living in a western region of France.

The survey was carried out from 1988 to 1993 in Brittany (1,960,000 inhabitants) and Pays de Loire (2,175,500 inhabitants). All nephrologists working in this region (18 units or departments of nephrology) participated in the survey within the Working Party on ADPKD (further information can be obtained from the author). The survival of patients was calculated according to the Kaplan-Meier method in 889 affected subjects, of whom 592 were members of propositus kindreds. The distribution according to status at the time of the survey was as follows. 448 were living without dialysis or transplantation, 296 were treated by dialysis or died of renal causes, and 153 died of unknown causes. Patients who died of unknown causes were considered as censused data (high hypothesis) or as death of renal cause (low hypothesis). The survival curves of both hypotheses were similar, and the pro-

30 40 50 60 Age (years)

Fig. 1. Cumulative survival to ESRD in 889 ADPKD patients. There is no difference between males and females.

males and 16 females) reached ESRD between 45 and 65 years of age (intermediate form), and 47 (18 males and 29 females) reached ESRD at an age > 65 years (slow form). The mean rate of annual decline of glomerular filtration during the 5 years preceding ESRD was evaluated in each group, and the degree of significance was studied by the Wilcoxon nonparametric test. The creatinine clearance was calculated by using the formula of Cockcroft and Gault [8]. As shown in figure 2, in males with the early form, the slope of the decline of renal function (creatinine clearance (-9.9 ml/min/year) was significantly steeper than in females (-4.0 ml/min/year; p < 0.01). By contrast, the rate of progression of ADPKD was not significantly different (-5.5 vs. 4.4 ml/min/year; NS) in
The survival curve was similar to that in other affected family members. So, cumulative survival to ESRD in 889 affected subjects was not different between males and females (fig. 1), confirming other European studies [4, 5]. In our region 22% of the patients had ESRD by the age of 50 years, 42% by the age of 58, and 72% by the age of 73 years. Our survey confirms the results of others [2-6].

In order to evaluate the rate of annual decline of glomerular filtration (ml/min/year), we have selected 110 patients who had ESRD and who had had at least one assay of serum creatinine each year during the 5 years preceding ESRD. Among 110 patients, 33 (16 males and 17 females) reached ESRD under 45 years of age (early form), 30 (14 males and 16 females) under 65 years (intermediate form), and 47 (18 males and 29 females) over 65 years (slow form).

![Fig. 2. Slopes of decline of renal function during the last 5 years preceding ESRD in males (a) and females (b). Males who reached ESRD under 45 years of age had a slope steeper than females of the same age group, while the slope was similar in males and in females with survival to ESRD over 65 years. It was intermediate in males who reached ESRD between 45 and 65 years of age. GFR = Glomerular filtration rate.](image)

males and females over 65 years, but was still significant in the intermediate form (-7.8 vs. -4.4 ml/min/year; p < 0.01). So, males under 65 years of age have a rate of progression towards renal failure that is significantly more rapid than in females of the same age group. Male gender could be a risk factor for an unfavorable prognosis of ADPKD under 65 years of age, as suggested in other studies [6, 7]. Since the risk linked to gender is disappearing over 65 years of age, the role of male hormones for an unfavorable prognosis of ADPKD in young males is strongly suggested [7]. The greater frequency of arterial hypertension in the male population, particularly under 65 years of age [9], could contribute to the rapid progression to ESRD in young males with ADPKD. An interesting recent experimental study [10] has examined the possibility of a Y-linked effect on blood pressure operating through the kidney.

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