PART XVII

PREGNANCY

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Proc EDTA–ERA (1985) Vol 22

THE EFFECT OF PREGNANCY ON THE NATURAL HISTORY OF PRIMARY GLOMERULONEPHRITIS

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Summary

The effect of pregnancy on kidney disease was studied for 66 pregnancies in 48 women with primary glomerulonephritis and the course compared with 36 non-pregnant women with glomerulonephritis. The clinical status of the nephropathy, age and histological type was similar in both groups at the beginning of the study. Progress of the kidney disease was assessed according to the rise in creatinine, hypertension and proteinuria versus time for one and five years, and using at the same time Rutherford's linear regression analysis. After one year and at the end of the follow-up, there was no significant difference in the progress of the kidney disease between the two groups. These data indicate the lack of repercussion of pregnancy in most cases of glomerulonephritis.

Introduction

The effects of pregnancy on the natural history of glomerulonephritis are a matter of controversy. Some authors feel that during pregnancy there may be functional impairment and worsening of histological lesions of the kidneys [1]; however, most authors [2,3] believe that the natural course of glomerulonephritis is not affected by pregnancy if renal function is intact and there is no hypertension. The presence of hypertension, particularly severe hypertension, worsens the prognosis by increasing perinatal mortality and prematurity [4]. Furthermore, the accelerated development of hypertension during pregnancy may precipitate the loss of renal function.

To assess the effect of pregnancy on primary glomerulonephritis we studied, in the short and medium term, a group of women by comparing the course of their disease with a control group of non-pregnant women with glomerulonephritis.

Material and methods

We followed the course of 66 pregnancies in 48 women (mean age 29±3 years) suffering from primary glomerulonephritis. The control group consisted of 36 non-pregnant women (mean age 26.5±2 years) with primary glomerulonephritis who presented a clinical status similar to that of the pregnant group in terms of renal function, blood pressure and proteinuria. The histological type of the control group was formed by 11 membrano-proliferative glomerulonephritis, 10 IgA nephropathies, 10 glomerulosclerosis and 5 membranous glomerulonephritis, and the group of pregnant women consisted of 16 cases of membrano-proliferative glomerulonephritis, 13 glomerulosclerosis, 10 IgA nephropathies, 7 membranous glomerulonephritis and 2 focal glomerulonephritis.

The effect of pregnancy on kidney disease was assessed by plasma creatinine, proteinuria and blood pressure. In both groups, pregnant and non-pregnant, the course of these parameters was followed at one year and five years. Progression of the glomerulonephritis was defined by the rise of plasma creatinine over time, using Rutherford's linear regression analysis [5].

Proteinuria was considered to have deteriorated if there was a 100 per cent increase over initial values or the appearance of a nephrotic syndrome. Patients were considered to be hypertensive when blood pressure during pregnancy was greater or equal to 140/90mmHg in supine position after 10 minutes rest, and was considered worse if the diastolic pressure increased by 20mmHg.

Results

After one year in the group of pregnant women, two patients had worse kidney function (4.1%), four showed a rise in blood pressure (8.3%) and four an increase in proteinuria (8.3%). In non-pregnant women over the same period, three lost kidney function (8.3%), three increased blood pressure (8.3%) and one increased proteinuria (2.6%). These results show that the course of kidney function is worse in non-pregnant than in pregnant women (11% versus 8.3%) but that the rise in proteinuria is more pronounced in the pregnant women (8.3% versus 2.6%). Overall, these differences were not significant between the two groups. In the group of pregnant women 20 per cent deteriorated in some of the parameters analysed as compared to 18.9 per cent in the non-pregnant women (Table I).

The course of the glomerulonephritis was assessed in both groups after five years. In the group with pregnancies, nine showed a deterioration in renal function (18%), 17 increased blood pressure (37%) and 11 in proteinuria (24%). In the group with no pregnancy, 10 showed a loss of renal function (29%), 10 in blood pressure (29%) and 7 in proteinuria (19%). The deterioration in kidney function was more marked in the non-pregnant women (29% versus 18%) and the rise in arterial pressure was greater in the group with pregnancies (37% versus 29%). However, overall involvement of the parameters analysed was similar in both groups: 69 per cent in the pregnant women and 77 per cent in the non-pregnant group.

The progression of the glomerulonephritis defined by the rise of plasma

TABLE I. Immediate effects of pregnancy on glomerulonephritis

	Pregnant group (48)		Non-pregnant group (36)	
	Before pregnancy	3 months after delivery	Start study	Status at one year
mean serum creatinine mg%	0.83±0.36	0.89±0.41	1.01±0.47	1.22±0.52
mean blood pressure mmHg	142±13	151±16	147±15	149±21
proteinuria g/24hr	1.49±0.53	1.92±1.04	1.03±1.49	1.14±1.63
	Number of cases	Incidence (%)	Number of cases	Incidence (%)
Impairment of renal function	2	(4.1)	3	(8.06)
Increased blood pressure	4	(8.7)	3	(8.06)
Increased proteinuria	4	(8.7)	1	(2.06)
Total effects	10	(21.5)	7	(18.18)

Differences in renal function, blood pressure and proteinuria between two groups of women (pregnant and non-pregnant) after one year of follow-up

TABLE II. Repercussion of pregnancy on renal function

	Pregnant group (34)		Non-pregnant group (25)		
(Mean slope b x 10^3)	Before pregnancy	3 months after delivery		Number of cases	Significance*
IgA nephropathy (10)	1.7±2.28	−0.2±3.34	−2.06±3.88	10	NS
Focal glomerulo-sclerosis (8)	0.17±1.67	1.02±3.89	0.22±0.48	5	NS
Membrano-proliferative glomerulonephritis (11)	1.25±2.75	2.73±2.8	−0.03±0.49	6	NS
Membranous nephropathy (5)	1.75±0.55	−2±0.8	−1.7±1.2	4	NS

The control group was chosen among non-pregnant women with similar age, similar histological type, and similar status of nephropathy (renal function, proteinuria and hypertension). The progression rate was evaluated by linear regression analysis (Rutherford's method). In this follow-up we have included women with normal renal function at start of study. Mean follow-up was 52±3 months (25 months to 17 years). *Student's 't' test shows no differences between both groups

creatinine over time in both groups are summarized in Table II. Using Rutherford's linear regression analysis the incidence of renal failure and hypertension was similar in the two groups.

Discussion

The effects of pregnancy on kidney disease and its comparison with a control group shows that in the short and medium term there is no change in the natural course of glomerulonephritis caused by pregnancy. Our results agree with those recently published by other authors [2,3,6] showing a lack of adverse effect caused by pregnancy in most women with primary glomerulonephritis. Loss of kidney function due to pregnancy has been described in some forms of IgA nephropathy [7]; however, we did not note this pernicious effect in any of our patients. This difference may be attributable to the different clinical stage of the series analysed; the lack of hypertension and renal functional deficit could reasonably explain the absence of complications in our series. In 21 pregnant women with IgA nephropathy, Surian [6] observed no deficit in renal function attributable to the pregnancy, and Rovati [8] also mentions the scant repercussion of pregnancy on IgA nephropathy. Two women with membranoproliferative glomerulonephritis showed a marked impairment of renal function. In both of them their nephropathy was accompanied by hypertension and nephrotic syndrome. This histological form [3] and glomerulosclerosis [9] usually show worse results in fetal viability and in repercussion on the kidney disease than other histological forms. However, in women with membranoproliferative glomerulonephritis and glomerulosclerosis whose renal function was intact and had no hypertension, the renal repercussion of the pregnancy was nil and fetal viability high. Analysis of the risk factors, proteinuria in a nephrotic range, hypertension and kidney failure, show that the prognosis for the pregnancy depends more on their coexistence than on the histological form of the glomerulonephritis [10].

The study of both groups, pregnant and non-pregnant, with glomerulonephritis shows a similar incidence in the appearance of hypertension, increase in proteinuria or kidney failure after one year. The immediate effect of pregnancy on kidney disease is practically nil in most women. The analysis of these parameters after five years does not show any difference either between both groups, and the linear regression analysis was similar in both groups. All these data show that in the short and medium term there is no pernicious effect of pregnancy on the natural course of kidney disease. Only in certain cases accompanied by hypertension or renal failure one cannot exclude rapid evolution of the kidney disease during pregnancy, although pregnancies have been described in cases of advanced renal failure or haemodialysis, and with moderate kidney failure the prospects of pregnancy appear to be good [2].

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