

## DETERMINATION OF THE RISK FACTORS OF RENAL FAILURE PATIENTS. A CASE-CONTROL STUDY

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Article Received on  
17 June 2018,

Revised on 07 July 2018,  
Accepted on 27 July 2018

DOI: 10.20959/wjpr201815-12940

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### ABSTRACT

**Background:** Renal failure is a chronic disease caused by a complete weakness for the functioning of one or both kidneys and makes them unable to perform their functions positively. **Aims:** to identify the risk factors for patients with renal failure in nephrology unit. **Methods:** A case-control study conducted in nephrology unit in the Al-Kindi teaching hospital in Baghdad. All cases admitted to the centre from January, 2018 to the end of June 2018 was enrolled to this study. Case of this study were patients in the age range of 30 to 70 years and who

intentionally had a renal failure. For the control were patients in the same range of age who are with general other medical and surgical condition, treated in the same hospital where cases selected at similar time period. **Results:** There were 240 participants, 120 per group (case and control) in the study. Mean age (SD) for cases 60(9.9) and for control 60 (14.1). In this table indicated that the advanced age (OR=0.903, 95% CI: L=0.5415, U=1.5059), gender (OR= 0.87, 95% CI: L= 0.4942, U= 1.5627), Marital status (OR= 1.625, 95% CI: L= 0.9671, U=2.7305), occupation OR=0.9503, 95% CI: L=0.5892, U= 1.5328) and the education OR=0.677, 95% CI L=0.3794, U=1.2095). There are not significant relation between variables and among cases and controls at p. value 0.05. **Conclusions and recommendations:** The majority were males, married, unworked and had a secondary education. There is a link between the family history, alcohol and renal failure. Diabetes, hypertension are also contributory factors for renal failure. Further research on this field to identify the causes and risk factors of the disease.

**KEYWORD:** Renal, case-control, gender, nephrology, history.

## INTRODUCTION

Renal failure is a chronic disease caused by a complete weakness for the functioning of one or both kidneys and makes them unable to perform their functions positively.<sup>[1]</sup> This results in a severe imbalance in the human body as a result of the accumulation of waste in the body and the inability to get rid of it.<sup>[2]</sup> The clinical manifestations of renal impairment are the appearance of albumin or protein in the urine, which is detected by urine analysis.<sup>[3]</sup>

The patient suffers from nausea, weight loss, and changes from skin colour and mucous membranes.<sup>[3]</sup> The increase in protein consumption, especially red meat, increases the burden on the kidneys in metabolism. The use of excessive pain relievers can lead to severe damage to the liver and kidneys, in addition to the feeling of general weakness and severe itching of the skin and pain.<sup>[4]</sup> Then, the smoking interferes with the flow of blood into the kidneys and reduces its ability to function normally, and the poisoning of kidney alcohol and liver.<sup>[5]</sup> Scientific studies have found that people who consume sugary drinks are more likely to appear to the protein in the urine, the kidneys do not do their job properly.<sup>[6]</sup> Aimed of this study to identify the risk factors for patients with renal failure.

## Methods

The design was a case-control study conducted in nephrology unit in the Al-Kindi teaching hospital in Baghdad. All cases admitted to the centre from January, 2018 to the end of June 2018 was enrolled to this study. Case of this study were patients in the age range of 30 to 70 years and who intentionally had a renal failure. For the control were patients in the same range of age who are with general other medical and surgical condition, treated in the same hospital where cases selected at similar time period.

## Inclusion & Exclusion criteria

**Inclusion criteria:** All patients who clearly had a renal failure and confirmed by physician.

**Exclusion criteria:** Patients who do not had a physician confirmation on renal failure  
Patients with renal failure referred from another centre.

## Instrument Development and Validation

Semi-structured questionnaires was used to collect the information on the variables of interest from participants.

### Pilot study

Twelve cases were participated in the pilot study to assess the feasibility of questionnaire which was conducted in the hospital to get preliminary data on renal failure among patients.

### Sample size and Sampling

The Sample size was calculated by using the following formula.<sup>[29]</sup>

$$n = \left( \frac{r+1}{r} \right) \frac{(\bar{P})(1-\bar{P})(Z_{\beta} + Z_{\alpha/2})^2}{(P_1 - P_2)^2}$$

Expected proportion in controls (0.04); assumed odds ratio (4), Confidence level 0.95; Power (0.8), the sample size per group 120 and the totally was 240.

### Data analysis

Before main analysis data was checked for quality and statistical assumptions. Data was described by using descriptive statistics such as frequency, percentage, mean, SD. Also odds ratio, 95% CI. STATA version 14 statistical package was used to analyse the data and level of uncertainty will be set at 5%.

### Ethical consideration

Ethical clearance was obtained from the Ministry of Health/ Iraq. Oral and written informed consent were obtained from each participant before the commencement of interview. Any participant has the right to withdraw from the study at any time when they are no longer interested or comfortable with the research.

### RESULTS

There were 240 participants, 120 per group (case and control) in the study. Mean age (SD) for cases 60(9.9) and for control 60 (14.1). In this table indicated that the advanced age (OR=0.903, 95% CI: L=0.5415, U=1.5059), gender (OR= 0.87, 95% CI: L= 0.4942, U= 1.5627), Marital status (OR= 1.625, 95% CI: L= 0.9671, U=2.7305), occupation OR=0.9503, 95% CI: L=0.5892, U= 1.5328) and the education OR=0.677, 95% CI L=0.3794 , U=1.2095). There are not significant relation between variables and among cases and controls at p. value 0.05 [Table 1].

According to family history of renal failure (OR=0.56, 95% CI: L= 0.3161, U=0.99) are the modifiable risk factors of renal failure among the selected subjects. The risk for renal failure

among alcoholism patients are 2.6 times frequent than non-alcoholism (95% CI L=1.1447, U= 5.9791) [Table 2].

Concerning for chronic diseases among participants. In this table indicated that the risk for renal failure are 2 times among diabetes patients than non-diabetes (95% CI L= 1.1901, U=3.3906) and 0.5 times frequent among hypertension patients than not having hypertension. Other risk factors for renal failure include UTI (OR=0.78, 95% CI L=0.468, U= 1.3153), heart failure (OR=1.32, 95% CI L=0.759, U=2.3098) [table3].

**Table 1: Characteristic of participants of renal failure.**

Characteristics of participants	Cases		Controls		Total		OR	95% CI
	No.	%	No.	%	No.	%		
<b>Age groups</b>								
30-45	67	55.8	70	58.3	137	57.1	0.903	0.5415 to 1.5059
46-70	53	44.2	50	41.7	103	42.9		
Total	120	100	120	100	240	100		
<b>Gender</b>								
Male	87	72.5	90	75	177	73.8	0.87	0.4942 to 1.5627
Female	33	27.5	30	25	63	26.3		
Total	120	100	120	100	240	100		
<b>Marital status</b>								
Married	78	65	64	53.3	142	59.2	1.625	0.9671 to 2.7305
Unmarried	42	35	56	46.7	98	40.8		
Total	120	100	120	100	240	100		
<b>Occupation status</b>								
Worked	51	42.5	50	41.7	101	42.1	0.9503	0.5892 to 1.5328
Unworked	69	57.5	70	58.3	139	57.9		
Total	120	100	120	100	240	100		
<b>Education status</b>								
Non formal education	27	22.5	36	30	63	26.3	0.6774	0.3794 to 1.2095
Secondary and high certificate	93	77.5	84	70	177	73.7		
Total	120	100	120	100	240			

**Table 2: Distribution of participants according to family history, alcohol and smoking habits.**

		Cases		Controls		Total		OR	95%CI
		No.	%	No.	%	No.	%		
<b>Family history of renal failure</b>	Yes	27	22.5	41	34.2	68	28.3	0.5594	0.3161 to 0.99
	No	93	77.5	79	65.8	172	71.7		
	Total	120	100	120	100	240	100		
<b>Alcohol use</b>	Yes	21	17.5	9	7.5	30	12.5	2.6162	1.1447 to 5.9791
	No	99	82.5	111	92.5	210	87.5		
	Total	120	100	120	100	240	100		
<b>Smoking</b>	Yes	79	65.8	66	55	145	60.4	1.5765	0.9361 to 2.655
	No	41	34.2	54	45	95	39.6		
	Total	120	100	120	100	240	100		

**Table 3: Distribution of participants according to chronic disease.**

Chronic disease	Cases		Controls		Total		OR	95%CI
	No.	%	No.	%	No.	%		
<b>Diabetes mellitus</b>								
Yes	59	49.2	39	32.5	98	40.8	2.0	1.1901 to 3.3906
No	61	50.8	81	67.5	142	59.2		
Total	120	100	120	100	240	100		
<b>Hypertension</b>								
Yes	32	26.7	47	39.2	79	32.9	0.56	0.3272 to 0.975
No	88	73.3	73	60.8	161	67.1		
Total	120	100	120	100	240	100		
<b>UTI</b>								
Yes	45	37.5	52	43.3	97	40.4	0.7846	0.468 to 1.3153
No	75	62.5	68	56.7	143	59.6		
Total	120	100	120	100	240	100		
<b>Heart disease</b>								
Yes	39	32.5	32	26.7	71	29.6	1.3241	0.759 to 2.3098
No	81	67.5	88	73.3	169	70.4		
Total	120	100	120	100	240	100		

## DISCUSSION

Our study to identify the risk factors for patients with kidney failure. Age is one of the factors related to renal failure, especially among the elderly. In our study we found that the majority were in the range of age 30 to 45 years (55.8% cases vs 58.3% control), unlike the study from Nigeria the authors found the majority of renal failure were among elderly people.<sup>[7]</sup> For gender, also is a part for increasing the number of cases of the disease and varies severity by gender. Most of the studies suggest that there is a link between gender and renal failure.<sup>[8,9,10]</sup> But in our study we found no correlation between them, and this is due to the different lifestyle for some of them and followed by the level of economic and living status between countries. Majority of cases had a married status (65% case vs 53.3% control), other result from US<sup>[11]</sup>, the authors found the majority are divorcing, separated relation or had a relation without marriage. This refer to different in our religion and economic situation between countries.

When you have a special job and a good income, your standard of living and economy is good and this is related to the lifestyle you follow. But, if you suffer from lack of your standard of living and also this effects on your health. Some studies suggest that there is a correlation between occupation and standard of living with renal failure.<sup>[12,13]</sup> But in our study we found that, there is no correlation between them; so this is due to the difference in living

style between countries and the way that the individual is followed to obtain a good economic level as well as the health.

Our result found that the majority of cases had a secondary education (77.5% case vs 70% control). Compare with another result from India, the authors found that the majority had a non-formal education and this difference refer to the majority are living under a poor economic and health status. Or you live with a large family and you cannot get your life requirements.<sup>[14]</sup> The previous study found that a link between family history and disease, also in our result found the relation between family history and renal failure, the odds ratio of disease is 0.5 times of cases of family history than not having a history of the disease.<sup>[11,15]</sup> Drinking alcohol among people has an effect on the body and the body's willingness to develop kidney failure if the person is addicted to alcohol.<sup>[16]</sup> In our study we found that there was a link between alcohol intake and renal failure. The odds of getting the disease is 2 times for cases group than the control group and the 95% CI (1.144 to 5.97).

Regarding to smoking history, found that the most of the cases had a smoking history more than a control group (65.8% case vs 55% control), compare with a result from Ian<sup>[9,17]</sup>, the authors found the majority of cases and control had a history of smoking. In this study found, there is no relation between smoking and renal failure. Our result found the relation between diabetes and renal failure. Odds for getting the renal failure was 2 times for cases of diabetes than the control group without diabetes. (49.2% case vs 32.5% control). There is a relation between hypertension and renal failure (26.7% vs 39.2%). Our result is similar to another results from Nigeria<sup>[7]</sup> and Taiwan<sup>[18]</sup>, they found the same relation. Therefore, in this study, we didn't find any relation between renal failure and heart disease (32.5% case vs 26.7% control). Another result from US<sup>[11]</sup>, the authors found that the most of cases had a heart failure problem.

## CONCLUSIONS

The majority were males, married, unworked and had a secondary education. There is a link between the family history, alcohol and renal failure. Diabetes, hypertension are also contributory factors for renal failure.

**Recommendations:** Further research on this field to identify the causes and risk factors of the disease.

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