

## INTRADIALYTIC HYPOTENSION, QUALITY OF LIFE AND FIVE YEAR SURVIVAL IN DIALYSIS PATIENTS

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### Abstract

As complication of hemodialysis, intradialytic hypotension (IDH) is associated with a risk of mortality. These patients suffer from diminished/poor quality of life (QOL). The aim of this study was to compare the QOL and survival of two groups of dialysis patients, according to the presence of IDH.

The prevalent population of 162 dialysis patients from one dialysis centre was divided according to the presence of IDH. Patients were scored for QOL with the standard SF 36 questionnaire at the start of the study.

The percentage of IDH was 26%. Groups were not statistically different for participant's age, dialysis vintage and presence of diabetes. QOL scores from all domains were substantially reduced in the IDH group of patients. The component scores for the physical and mental domains were nearly half and statistically worse in IDH group of patients ( $p=0.0001$ ,  $p=0.0001$ ). During 60 months of follow-up, 23 (55%) of patients died in the IDH group, and 46 (38%) in the group without IDH. Kaplan Meier curves showed statistically better survival in the non - IDH group, when compared to IDH group in months ( $47.67 \pm 1.98$  v.s.  $39.74 \pm 3.40$ ,  $p=0.038$ ). Cox regression analysis showed that patients with IDH had 1.68 higher risk of death, with confidence interval of 1.021 - 2.78,  $p=0.041$ .

IDH deteriorates the QOL and life expectancy in dialysis patients. Interventions are needed on modifiable factors affecting IDH in order to achieve better outcomes.

**Key words:** mortality, hemodialysis, quality of life, survival, hypotension

### Introduction

As most common complication of hemodialysis, intradialytic hypotension (IDH) is associated with high ultrafiltration, cardiovascular disease, diabetes, poor nutritional status and risk of mortality [1]. Patients suffering from frequent episodes of hypotension during dialysis, need longer recovery time from dialysis session, which worsens quality of life (QOL) [2, 3]. IDH accelerates fistula thrombosis [4] problems of achieving dry weight and body sodium load. We hypothesize that identifying patients prone to IDH would provide early detection of those with higher risk of mortality and lower QOL. The aim of this study was to compare the quality of life and survival of two groups of prevalent dialysis patients, according to the presence of intradialytic hypotension. Kaplan - Meier curves were obtained to perform survival analysis on behalf of IDH and Cox regression analysis was performed to investigate mortality risk association with IDH.

### Methods

The prevalent population of 162 dialysis patients from one dialysis centre was divided into two groups according to the presence of IDH during dialysis sessions over the previous three months. We used the definition of intradialytic hypotension by the European Best Practice Guideline on Haemodynamic Instability, as a relative or an absolute decline in blood pressure, as well as the presence of specific symptoms, with a need for nursing [5]. Patients were scored for QOL with the standard SF 36 questionnaire at the start of the study [6]. Questions were translated and adapted to local language. Answers were converted into numbers combined to definitive 8 scale scores. The different domain scores were transformed to a 0 to 100 scale, with a higher score indicating a better QOL. Finally, the physical and mental components of the eight scales were combined into a physical (PCS) and mental (MCS) component summary score. The medical histories and interviews were used for data collection on socio-demographic, nutritional, clinical indices and dialysis factors.

Statistical analysis was performed with SPSS 16.0 for Windows. Descriptive data are presented as mean ± standard deviation (SD). Percentages are given for categorical variables. The two groups were compared with Student's t-test, and Mann Whitney test was used for variables without normal distribution. Kaplan Meier curves were obtained to perform survival analysis on behalf of IDH and Cox regression analysis was performed to investigate mortality risk association with IDH. A P-value of 0.05 or less was considered significant.

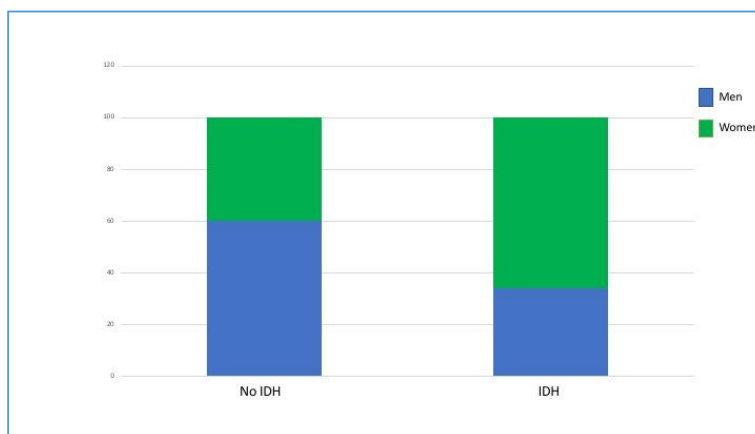
**Results**

Comparative analysis of the two study groups is shown in Table 1.

Considering the whole investigated population, the group of patients prone to IDH consisted of a smaller number of patients (42) compared to patients without IDH (120). The total percentage of IDH was 26%. Groups were not statistically different for participant's age, dialysis vintage and presence of diabetes (p= 0.772, p=0.444, p= 0.264), respectively. As for the dialysis treatment regime, mean time of the dialysis session was not different in both groups, and also the achievement of dialysis adequacy was in the target range. Patients prone to IDH experienced higher rates of ultrafiltration (p=0.004) and included a smaller number of male subjects (p=0.03) (Figure 1). Inflammation recognized by CRP was the same in both groups, but nutritional indices were different. Better tolerance to dialysis treatment was accompanied with significantly higher levels of serum albumin, but lower BMI (p=0.02, p=0.002), respectively.

**Table 1.** Comparative analysis of the two study groups on demographic, clinical and dialysis indices.

Variables	Without IDH (N=120) Mean ± SD / %	IDH (N=42) Mean ± SD / %	p
Age (years)	55.97 ± 13.57	56.67 ± 12.83	0.772
Dialysis vintage (months)	97.95 ± 73.98	108.45 ± 82.22	0.444
Women (%)	49 (40%)	28 (66%)	0.03
Diabetes (%)	32 (24%)	10 (32%)	0.264
BMI (Kg/m <sup>2</sup> )	23.36 ± 3.89	25.89 ± 5.71	0.002
Albumin (g/L)	39.12 ± 2.42	37.97 ± 2.64	0.02
C-Reactive protein (ng/ml)	6.73 ± 8.5	7.5 ± 8.38	0.634
Kt/V	1.38 ± 0.20	1.38 ± 0.23	0.887
Dialysis time (hours)	4.07 ± 0.24	4.06 ± 0.21	0.813
Ultrafiltration (L)	3.08 ± 0.81	3.55 ± 0.78	0.004



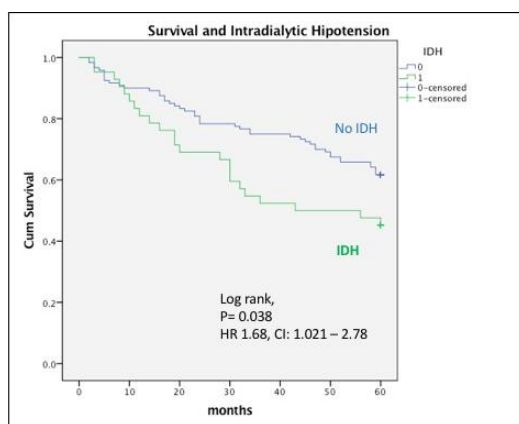
**Figure 1.** Gender differences regarding Intradialytic Hypotension (IDH)

Quality of life scores from all domains were substantially reduced in the IDH group of patients, as shown in Table 2. In both groups the most deteriorated scale was the perception of general health and role-physical. The component scores for the physical and mental domains were nearly half and statistically worse in IDH group of patients ( $p=0.000$ ,  $p=0.000$ ).

**Table 2.** Differences in quality of life domains according to presence of intradialytic hypotension (IDH)

SF-36 scores	No- IDH group (N=120)	IDH group (N=42)	P
Physical functioning	57.86 ± 31.65	33.78 ± 32.45	0.000
Role-physical	46.33 ± 41.34	27.98 ± 42.12	0.015
Bodily Pain	66.70 ± 30.65	49.30 ± 33.22	0.002
General health	38.38 ± 17.61	27.61 ± 17.84	0.001
Role-emotional	61.503 ± 40.03	42.09 ± 41.70	0.000
Social functioning	64.19 ± 32.06	47.62 ± 33.95	0.005
Vitality	51.02 ± 26.00	33.33 ± 23.57	0.010
Mental health	58.05 ± 20.34	45.12 ± 17.28	0.000
Physical component (PCS) score	52.06 ± 25.68	34.42 ± 26.41	0.000
Mental component (MCS) score	54.60 ± 23.55	39.27 ± 23.29	0.000

During 60 months of follow-up, 23 (55%) of patients died in the IDH group, and 46 (38%) in the group without IDH. Kaplan - Meier curves (Figure 2) showed statistically better survival in the non - IDH group, compared to IDH group in months ( $47.67 ± 1.98$  v.s.  $39.74 ± 3.40$ ,  $p= 0.038$ ). Cox regression analysis showed that patients with IDH had 1.68 higher risk of death, with confidence Interval of 1.021 - 2.78,  $p=0.041$ , (Figure 2).



**Figure 2.** Kaplan - Meier survival and intradialytic hypotension (IDH)

### Discussion

During last decade, the frequency of intradialytic hypotension has remained unchanged at about 25% of all HD sessions [7]. In our study, there were 26% of patients prone to IDH. Among

patients at risk, according to published data, the most common are patients with diabetes, CVD, diastolic dysfunction, poor nutritional status and hypoalbuminemia, severe anemia, older age, high volume ultrafiltration or low blood pressure. The prevalence of IDH goes up to 50% in some studies, but this higher rate is due to wide definitions. We also investigated the quality of life, looking for the group of patients with IDH and deterioration of life quality in respect of longer need for recovery after the dialysis session. Our group of IDH patients was presented with lower albumin levels, but higher BMI. The explanation behind this is possibly in the unexpected finding of false high BMI, which could be a result of unreal dry weight and excess of fluids. The more frequent episodes of hypotension with need for nursing, we found in women and patients with higher ultrafiltrations, and these findings are in correlation with current literature [8].

The QOL measurements in our patients showed marked deterioration of both physical and mental scores as in other geographically close populations [9, 10, 11]. Patients with IDH have even lower scores in all physical and mental scales. The perception of general health was most affected as it was found in other studies, too [3].

Patients without presence of IDH live longer and have lower mortality risk [2]. The Kaplan Meier survival curves of our patients showed also worse outcomes in patients prone to IDH and hazard ratio for death 1.68 times higher than in the other group. Since lower QOL predicts mortality [11], we assume that factors affecting both the evolvement of IDH and lower QOL intercept in expressing low life expectancy of our patients. Discovering patients prone to IDH, intervening on risk factors could improve the quality of life and survival of this vulnerable group of patients.

### Conclusion

Intradialytic hypotension is a common complication of dialysis treatment. It deteriorates the quality of life and life expectancy of dialysis patients. Interventions are needed on modifiable factors affecting IDH in order to achieve better outcomes.

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