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OPTIMAL WEIGHT AND DIALYSIS DOSE IN PATIENTS ON PERIODIC HEMODIALYSIS

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Small patients tend to be better dialyzed than large ones. We analyzed the delivered dose of dialysis in two groups of patients - group A, body weight over 50 kg (n=39, m:f=28:1; 57,4 8,3 kg) and group B, body weight under 50 kg (n=15, m:f=6:9; 45,4 3,4 kg). We calculated KT/V and Time Average Concentration of urea (TAC) using two-pool method for urea kinetic modeling. The patients from group B had a higher KT/V urea =1,35 0,25 ($p < 0,05$) and lower TAC =13,7 2,72 ($p < 0,05$) with a shorter dialysis time. Mean serum protein and albumin levels for a year did not differ.

Key-words: Urea kinetic modeling, dose of dialysis, KT/V urea, TAC urea, standard body weight

Adequacy of haemodialysis treatment is of essential imprtance for the morbidity and survival rates of dialized patients (1). A primary method for assessing the delivered dose of dialysis represents the calculation of KT/V where K is urea clearance of the dialyzer, T is duration of dialysis in min, and V is volume of urea distribution in ml. The objective of the present study is to analyze the dose of dialysis delivered to the patients in dependence on their standardized body weight using an urea-kinetic modelling (UKM) as well as to to evaluate the possibilities for individual dose estimation of dialysis treatment.

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MATERIAL AND METHODS

During an one-year period 54 randomly selected patients at a stabilized clinical status were studied. They were 44 males (63 per cent) and 20 females (37 per cent) at a mean age of 51,23 ± 11,64 years. They underwent a chronic haemodialysis longer than one year the mean duration being 5,2 ± 3,62 years. Blood samples for pre- and postdialysis urea were taken in three-month intervals immediately prior to and 2 min after finishing the dialysis procedure. The samples for total protein and albumin were taken before the dialysis procedures. Routine laboratory methods were used for the aforementioned parameters. Acetate dialysis was carried out trice weekly with Nephral 1,2 m2 dialyzers without reuse.

Two-needle vascular approach was used.

The patients were divided into two subgroups according to their optimal weight. Subgroup A included 39 patients, 28 males and 11 females with weight over 50 kg. Subgroup B consisted of 15 patients, 6 males and 9 females with weight below 50 kg. Using the UKM method of Daugirdas, a double space model (3), a computer software for UKM (MEDICS GmbH 1994), KT/V and Time Average Concentration of Urea - TAC) could be estimated. All the data were presented as $x \pm SD$. Variation analysis was applied for statistical processing of the results. The reliability was defined as $p < 0,05$ by means of Student's *t*-test.

RESULTS AND DISCUSSION

The results obtained are summarized on Table 1. There is a statistically significantly higher dose of dialysis in the patients with a lower optimal weight (of subgroup B): KT/V = 1,35 ± 0,25 at $p < 0,05$. TAC values are significantly lower (13,7 ± 2,72 at $p < 0,05$) despite the shorter average dialysis time of 226 ± 17 min at $p > 0,05$ than those of subgroup A (KT/V = 1,12 ± 0,21, TAC = 16,4 ± 2,21, average dialysis time of 232 ± 15). The concentrations of the total protein and albumin do not differ statistically significantly in these patients' subgroups.

CONCLUSION

Based on the results obtained and the experience shared by other investifgators (1,2) a conclusion could be drawn that patients on haemodialysis who are with low optimal level receive a higher dialysis dose and their TAC values are lower even in shorter dialysis time. The

Table 1

Basic and UKM-calculated parameters of dialysis adequacy of patients with standard (subgroup A) and low (subgroup B) optimal weight

Parameters	Subgroup A n=39	Subgroup B n=15
Dialysis time T (min)	232 ± 15	226 ± 17
Average blood flow Qb (ml/min)	283 ± 14	286 ± 15
Dialysate flow Qd (ml/min)	500	500
Average weight (kg)	57,4 ± 8,3	45,4 ± 3,4
Predialysis urea (mmol/l)	27,67 ± 5,68	25,45 ± 4,10
Postdialysis urea (mmol/l)	12,09 ± 3,91	10,12 ± 1,64
Total protein (g/l)	74,21 ± 6,17	74,37 ± 5,32
Albumin (g/l)	38,58 ± 3,43	38,23 ± 2,61
KT/V	1,12 ± 0,21	1,35 ± 0,25*
TAC (mmol/l)	16,4 ± 2,21	13,7 ± 2,72*
	1	2

* is $p < 0,05$ - 2:1

greater dialysis dose delivered does not influence significantly upon the concentrations of the total protein and serum albumin. Taking into consideration the high haemodialysis costs the opportunity for its individual dose determination in concrete patients enables a substantial reduction of the therapeutic expenditures.

REFERENCES

1. Coyne, D. W., J. Delmez, G. Spence, et al. *J. Amer. Soc. Nephrol.*, **8**, 1997, 1315-1321.- 2. Daugirdas, J. T., T. A. Depner. *Amer. J. Kidney Dis.*, **23**, 1994, 33-38.- 3. Sacai, K., M. Miyagy, Y. Matsumoto, et al. In: XXIX. Annu. Meet. ASN. New Orleans, 3-7.XI.1996. Abstracts.

Оптимално тегло и диализна доза при пациенти на периодична хемодиализа

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Резюме: Пациентите с ниско тегло се диализират по-добре от тези с високо тегло. Анализирана е получената диализна доза при две групи пациенти: група А - с телесно тегло над 50 kg (n=39, ж:м = 28:11; 57,4 ± 8,3 kg) и група Б - с телесно тегло под 50 kg (n=15; м:ж = 6:9; 45,4 ± 3,4 kg). Калкулирани са показателите за диализна доза - KT/V и TAC (Time Average Concentration of Urea) чрез използване на двупространен модел на урейно кинетично моделиране. При пациентите от група Б дозата на диализата е сигнификантно по-висока (KT/V = 1,35 ± 0,25; $p < 0,05$), а стойностите на TAC - значимо по-ниски (13,7 ± 2,72; $p < 0,05$) въпреки по-късото диализно време. Средните стойности на серумния белтък и албумина не се различават в продължение на една година.