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## **Deterinig of serum $\beta$ -2 microglobulin in level and clinic manifestations in patients with long-term hemodialysis treatment in Mongolia**

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**Objectives:** To determine for the first time in Mongolia the level of  $\beta$ -2 microglobulin in the plasma of patients who have undergone hemodialysis treatment for 4 years or more and to study it in relation to clinical symptoms.

**Methods:** In our study, we collected data from 60 patients undergoing hemodialysis treatment at the Medvic Dialysis Center and performed statistical analysis on Stata-17 and excel programs.

**Results:** Serum  $\beta$ -2 microglobulin in a total of 60 patients was averaging 23.5 mg/l, and the mean Glomerular filtration rate (GFR) was 9 ml/min/1.73 m<sup>2</sup>. There were no statistically significant differences in  $\beta$ -2 microglobulin levels depending on the patient's age, but  $\beta$ -2 microglobulin levels tended to increase with the age of the patient ( $p = 0.415$ ). The mean level of  $\beta$ -2 microglobulin was 26.7 mg/l in over 60 years of age, 25.2 mg/l in 41-50 years of age, and 21.3 mg/l in 51-60 years of age. There were no statistical differences in the study of  $\beta$ -2 microglobulin levels depending on the year of hemodialysis treatment ( $p = 0.257$ ). The average level of  $\beta$ -2 microglobulin in patients with  $GFR \geq 5$  ml/min/1.73 m<sup>2</sup> was 14.44 mg/l and inpatient with  $GFR < 5$  ml/min/1.73 m<sup>2</sup> was 28.09 mg/l. According to decreasing of GFR the average level of  $\beta$ -2 microglobulin was tended to increase relatively ( $p=0.422$ ). Total of the 60 patients, 11 had clinical signs, 2 hands x-rays showed a narrowing of the distance between the Distal Inter Phalangeal, Proximal Inter Phalangeal in 15 patients, multiple sclerosis in 20 patients, and osteoarthritis in 8 patients.

**Conclusions:** Our study, the first time determined serum  $\beta$ 2 microglobulin in patients who maintain hemodialysis for 4 years or more in Mongolia, the mean serum  $\beta$ 2 microglobulin level was 23.5 mg/l and clinical symptoms were found in 20% of patients in the study.

$\beta$ -2 microglobulin in HD patients

## Study of serum $\beta$ -2 microglobulin in hemodialysis patients

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### Abstract

**Background:** Serum levels of  $\beta$ -2 microglobulin increase in hemodialysis patients and accumulate in tissues as deposits. It depends on what dialyzer is being used and how much residual renal function there is. Therefore, the serum levels of  $\beta$ -2 microglobulin, X-rays of the hands, residual renal function, and clinical abnormalities were compared in patients undergoing hemodialysis for 4 years or more.

**Aims and objectives:** To determine for the first time in Mongolia the level of  $\beta$ -2 microglobulin in the plasma of patients who have undergone hemodialysis treatment for 4 years or more and to study it in relation to clinical symptoms.

**Materials and methods:** In our study, we collected data from 60 patients undergoing hemodialysis treatment at the Medvic Dialysis Center and performed statistical analysis on Stata-17 and excel programs.

**Results:** Serum  $\beta$ -2 microglobulin in a total of 60 patients was averaging 23.5 mg/l, and the mean Glomerular filtration rate (GFR) was 9 ml/min/1.73 m<sup>2</sup>. There were no statistically significant differences in  $\beta$ -2 microglobulin levels depending on the patient's age, but  $\beta$ -2 microglobulin levels tended to increase with age of patient ( $p = 0.415$ ). The mean level of  $\beta$ -2 microglobulin was 26.7 mg / l in over 60 years of age, 25.2 mg / l in 41-50 years of age, and 21.3 mg / l in 51-60 years of age. There were no statistical differences in the study of  $\beta$ -2 microglobulin levels depending on the year of hemodialysis treatment ( $p = 0.257$ ). The average level of  $\beta$ -2 microglobulin in patients with GFR  $\geq 5$  ml/min/1.73 m<sup>2</sup> was 14.44 mg/l, and in patient with GFR  $< 5$  ml/min/1.73 m<sup>2</sup> was 28.09 mg/l. According to decreasing of GFR the average level of  $\beta$ -2 microglobulin was tended to increase relatively ( $p = 0.422$ ). Total of the 60 patients, 11 had clinical signs, 2 hands x-rays showed a narrowing of the distance between the DIP (Distal Inter Phalangeal), PIP (Proximal Inter Phalangeal) in 15 patients, multiple sclerosis in 20 patients, and osteoarthritis in 8 patients.

**Conclusions:** Our study, the first time determined serum  $\beta$ 2 microglobulin in patients who maintain hemodialysis for 4 years or more in Mongolia, the mean serum  $\beta$ 2 microglobulin level was 23.5 mg/l and clinical symptoms were found in 20% of patients in the study.

**Keywords:** Hemodialysis,  $\beta$ -2 microglobulin, glomerular filtration rate (GFR), dialyzer, residual renal function.