

Short Commentary over Extended-Hours Hemodialysis without Dietary Restrictions Contributes to Lower the Risk for Developing of DRA

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Abstract

Dialysis-related amyloidosis (DRA) is a well-known complication in patients undergoing long-term hemodialysis. β 2-microglobulin (β 2m) amyloid fibrils deposits in osteoarticular tissue, causing severe impairment of its function. High β 2m plasma levels are considered a prerequisite for developing DRA, but HD duration, age, and chronic inflammation are also significant risk factors. Our dialysis facility has provided combination therapies of "extended-hours hemodialysis" and "no dietary restrictions". "Extended-hours hemodialysis" promotes the removal of β 2m from the blood. "No dietary restrictions" improves the nutritional status of patients. We evaluated the clinical efficacy of extended-hours hemodialysis without dietary restrictions on the risk of developing DRA in long-term dialysis patients. In extended-hours hemodialysis without dietary restrictions, plasma β 2m concentration and the severity of median nerve compression of the wrist, which is an indicator of carpal tunnel syndrome, was low. In addition, we showed that dialysis time is a predictor of median nerve compression. The effect of extended-hours hemodialysis without dietary restrictions against the risk of developing DRA may not only be because of suppressed plasma β 2m levels but also due to properly maintained nutrition. The coexistence of malnutrition and inflammation is common in many dialysis patients. Nutrient deficiencies are said to make them vulnerable to inflammatory diseases. Reduced inflammation by maintaining proper nutrition through extended-hours hemodialysis without dietary restrictions may explain the reduced risk of developing DRA. In conclusion, extended-hours hemodialysis without dietary restrictions reduces the risk of developing DRA and maintains nutrition. Therefore, we propose that extended-hours hemodialysis without dietary restrictions are the preferred method for maintaining a patients' quality of life.

Keywords: β 2-microglobulin; Amyloid fibrils; DRA; Extended-hours hemodialysis

Discussion

Dialysis-related amyloidosis (DRA) is a well-known complication in patients undergoing long-term hemodialysis. Its main characteristics are the deposition of β 2-microglobulin (β 2m) amyloid in osteoarticular tissue such as wrist, shoulder, and spinal joints and tendons. Advances in dialysis technology appear to have contributed significantly to the reduction in prevalence and severity of DRA, but large-scale epidemiological studies have shown that DRA continues to occur [1]. Although improved dialysis techniques have undoubtedly played a role in delaying the onset of the disease, DRA still exists, and it seems impossible to completely prevent DRA with the current dialysis modality [2]. Although high plasma levels of β 2m are still considered a prerequisite for developing DRA, it has shown that blood levels of β 2m and the incidence of DRA does not always correlate. Factors that induce the onset are HD duration, age, and chronic inflammation [3].

Hemodialysis patients generally receive strict dietary restrictions to avoid electrolyte abnormalities and excessive weight gain. However, such restrictions can cause malnutrition and reduce BMI. Our dialysis facility has been providing combination therapies of "extended-hours hemodialysis" and "no dietary restrictions" for over 20 years. "Extended-hours hemodialysis" lowers blood β 2m concentration in patients by encouraging the removal of β 2m, a precursor protein of DRA [4], and provides excellent blood pressure control in dialysis

patients with hypertension [5,6]. In addition, it regulates electrolyte levels and contributes to stable hemodynamics during dialysis treatment by slow ultrafiltration. "No dietary restrictions" improves the nutritional status of patients [7]. Extended-hours hemodialysis without dietary restrictions is possibly an innovative treatment that guarantees the maintenance of good nutrition for the patient.

We evaluated the clinical efficacy of extended-hours hemodialysis without dietary restrictions against the risk of developing DRA in long-term dialysis patients [8]. The plasma concentration of β 2m was low in extended-hours hemodialysis without dietary restrictions. The severity of median nerve compression of the wrist, which is an indicator of carpal tunnel syndrome, was significantly lower. In addition, multivariate regression analysis showed that dialysis time was a predictor of median nerve compression.

The effect of extended-hours hemodialysis without dietary restrictions against the risk of developing DRA may not only be because of suppressed plasma β 2m levels but also due to properly maintained nutrition. "Malnutrition-inflammatory complex syndrome" (MICS) is common in many dialysis patients, and the coexistence of malnutrition and inflammation is associated with a poor prognosis [9]. Lowrie claims that nutrient deficiencies predispose hemodialysis patients to infections and the inflammatory process, making them vulnerable to inflammatory diseases [10]. Reduced inflammation by maintaining proper nutrition through extended-hours hemodialysis

without dietary restrictions may explain the reduced risk of developing DRA.

Conclusion

In conclusion, extended-hours hemodialysis without dietary restrictions reduces the risk of developing DRA and maintaining nutrition. Therefore, we propose that extended-hours hemodialysis without dietary restrictions are the preferred method for maintaining the patients' quality of life compared to the conventional hemodialysis method.

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