

Abstract

Introduction: Hemodialysis patients cause coronary artery diseases to a higher rate and have a poor survival prognosis. Brachial ankle pulse wave velocity (baPWV) is a reliable measurement of arterial stiffness, and could predict mortality in patients with end-stage renal diseases. It is generally thought that atherosclerosis is not improved by hemodialysis treatments. We retrospectively examined whether hemodialysis treatments improved atherosclerosis or not, using the value of baPWV/systolic blood pressure (SBP) as an arteriosclerotic index.

Methods: We examined the relationship between the value of baPWV, SBP and platelet counts of 14 hemodialysis patients and assessed the change of baPWV for 13 patients who were measured baPWV more than twice.

Results: 7 KH YDOXH RI ED3:9 DQG 6%3 VKRZHG WKH VLJQLƒFDQW SRVLWLWLYH FR the value of baPWV/SBP was used as an arteriosclerotic index. Value of 10 hemodialysis patients showed the

Keywords: Atherosclerosis; Hemodialysis; Decreased platelets count; Klotho gene

Introduction

Patients receiving maintenance hemodialysis for end stage renal disease have a worse survival and morbidity prognosis. The number of hemodialysis patients is annually increasing worldwide. Cardiovascular mortality rates among hemodialysis patients are approximately from 40% to 50% of deaths [1,2]. The cardiovascular mortality rates of the hemodialysis patients are higher than those of the general population by at least 10 times to 20 times. When a hemodialysis period becomes longer, the atherosclerosis is accelerated and patients develop cardiovascular diseases to a higher rate [1,3,4].

Patients with chronic kidney diseases died from much higher CVD than renal disease itself [5]. It is generally thought that atherosclerosis is not improved by hemodialysis treatments. Patients with CKD usually have traditional cardiovascular risk factors such as hypertension, hypercholesterolemia and diabetes mellitus.

Arterial stiffness can be assessed by noninvasive measurement of brachial ankle pulse wave velocity (baPWV), which is a simple and reproducible method [6,7]. baPWV reflects arterial wall structural components such as collagen and elastin, transmural pressure and smooth muscle tone, which mainly regulates arterial vessel distensibility and function [8,9]. baPWV is reported to be a crucial independent determinant of cardiovascular risk [10,11]. And baPWV could predict mortality in patients with hypertension [12], type 2 diabetes [13], and end-stage renal diseases [14].

The objective of the present study was retrospectively to elucidate whether hemodialysis treatments improve atherosclerosis or not, using the value of baPWV/systolic blood pressure (SBP) as an arteriosclerotic index and to clarify what the essential factor is.

Corresponding author: Hidekazu Takeuchi, Nagasaki-ken Tomie Hospital
499 Tomie-chou, Gotou-city, Nagasaki 853-0205, Japan, Tel: +81-959-86-1121;
E-mail: takeuch-h@r8.dion.ne.jp

Received April 08, 2013; Published July 11, 2013

Citation: Takeuchi H (2013) A Novel Risk Factor of Aggravating Atherosclerosis in Hemodialysis Patients; the Decreased Platelet Counts. 2: 735 doi: 10.4172/VFLHQWL735UHSRUWV

Copyright: © 2013 Takeuchi H. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

significance [14], we used the value of baPWV/SBP to evaluate arterial stiffness. The change was shown in Table 3. Among three patients (23%) who were not improved, the value of baPWV/SBP of two patients (Table 3; No.11 and No.12) was exacerbated slightly, but the baPWV/SBP value of the third patient (Table 3; No.13) was aggravated largely.

Among 10 patients with improved baPWV/SBP values, their platelet counts were more than 100,000/l. However, three patients whose baPWV/SBP values were not improved had the platelet counts less than 90,000/l. And there was statistically significant difference between their platelet counts of the two groups (Figure 2; $p < 0.001$). The three worsened patients were not infected by hepatitis C virus or hepatitis B virus.

Discussion

According to the results of the present study, hemodialysis treatments improved atherosclerosis of 10 hemodialysis patients, but atherosclerosis of three hemodialysis patients (23%) were not improved. When atherosclerosis of hemodialysis patients was evaluated, it was proper to consider the influence of hypertension on arterial wall and to use the value of baPWV/SBP as an arteriosclerotic index for hemodialysis patients.

Cardiovascular risk factors such as hypertension, inflammation, oxidative stress have been studied intensely [15]. In addition to these common cardiovascular risk factors, other factors such as uramic milieu and hemodialysis procedure itself such as heparin and dialysis

-
29. Adijiang A, Niwa T (2010) An oral sorbent, AST-120, increases Klotho expression and inhibits cell senescence in the kidney of uremic rats. *Am J Nephrol* 31: 160-164.
30. Kuro-o M, Matsumura Y, Aizawa H, Kawaguchi H, Suga T, et al. (1997) Mutation of the mouse klotho gene leads to a syndrome resembling ageing. *Nature* 390: 45-51.
31. Arking DE, Krebsova A, Macek M Sr, Macek M Jr, Arking A, et al. (2002) Association of human aging with a functional variant of klotho. *Proc Natl Acad Sci U S A* 99: 856-861.
32. Arking DE, Atzmon G, Arking A, Barzilai N, Dietz HC (2005) Association between a functional variant of the KLOTHO gene and high-density lipoprotein cholesterol, blood pressure, stroke, and longevity. *Circ Res* 96: 412-418.
33. Arking DE, Becker DM, Yanek LR, Fallin D, Judge DP, et al. (2003) KLOTHO allele status and the risk of early-onset occult coronary artery disease. *Am J Hum Genet* 72: 1154-1161.
34. Kempe DS, Ackermann TF, Fischer SS, Koka S, Boini KM, et al. (2009) \$FFHOHUDWHG VXLFLGDO HUUWKURF\WH GHDWK LQ 458: 503-512.