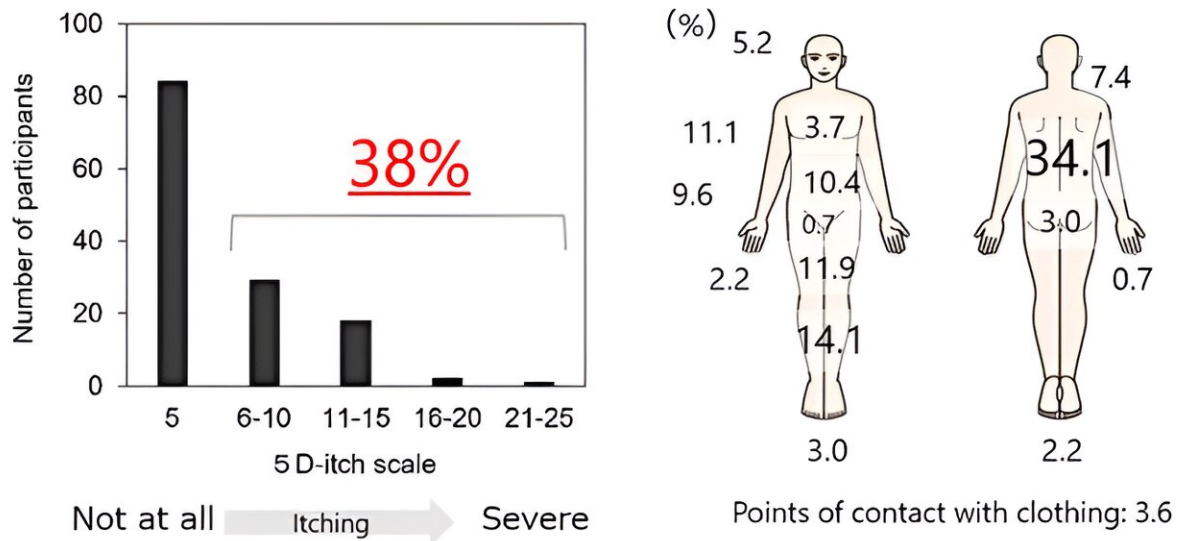


# Unveiling uremic toxins linked to itching in hemodialysis patients

February 19 2024



Severity and distribution of itching in hemodialysis patients. Credit: Niigata University

Hemodialysis patients commonly experience itching on a daily basis, which is distributed throughout their bodies. A research team led by Dr. Yamamoto has found several uremic toxins that cause itching in hemodialysis patients. They developed a "PBUT score" based on highly protein-bound uremic toxins (PBUT) that increase in the body with end-stage kidney disease. The PBUT score was associated with itching in hemodialysis patients.

Patients with advanced chronic [kidney disease](#) (CKD) require kidney replacement therapy, such as hemodialysis, to manage their condition. Hemodialysis patients often experience various symptoms, leading to a compromised quality of life and reduced activity levels.

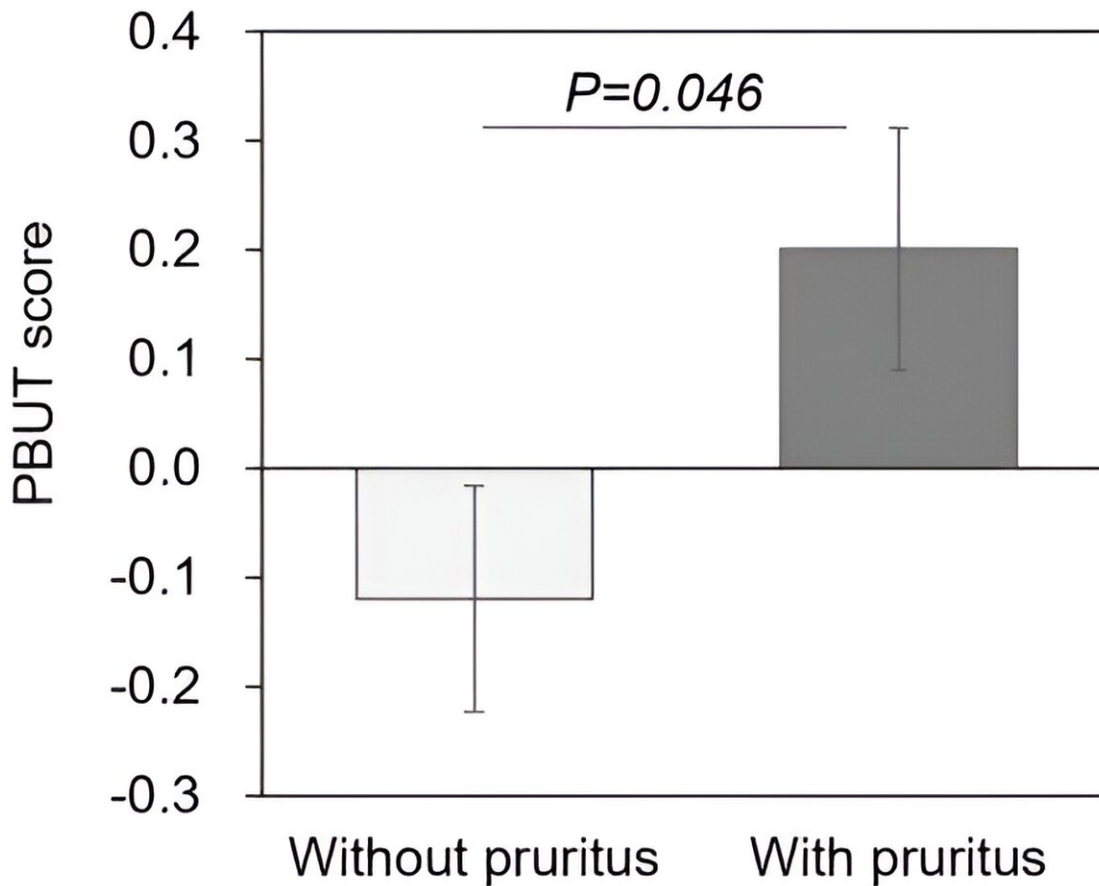
Itching is a common symptom frequently observed in [hemodialysis patients](#). Although its exact causes remain unclear, a survey conducted in Japan in 2000 found that itching was present in 73% of hemodialysis patients, and it was associated with elevated levels of  $\beta_2$ -microglobulin, calcium, phosphorus, or parathyroid hormone in the blood.

Subsequently, improvements in hemodialysis therapy and pharmacological treatments have led to changes in the severity of itching and its associated factors in hemodialysis patients.

Uremic toxins are a group of molecules whose concentrations increase in the blood due to kidney disease. Those molecules are associated with systemic diseases and prognosis in patients with end-stage kidney disease. Among them, molecules with high protein-bound properties, called PBUTs, such as indoxyl sulfate, are difficult to remove by dialysis therapy and have been reported to be associated with various pathologies. However, there have been no reports regarding their association with itching. in hemodialysis patients.

Dr. Yamamoto's team conducted a study to investigate the details of itching and factors associated with it, particularly focusing on PBUTs in hemodialysis patients. The work is [published](#) in the *Clinical Kidney Journal*.

They investigated hemodialysis patients from dialysis facilities in Japan. Assessing itching using the 5D-itch scale, we found that 38% of patients experienced itching, which was distributed throughout their backs and bodies.



The PBUT score and itching in hemodialysis patients. Credit: Niigata University

Through principal component analysis of PBUTs including indoxyl sulfate, p-cresyl sulfate, indole [acetic acid](#), phenyl sulfate, and hippuric acid, the PBUT score was generated. Patients with itching had higher PBUT scores compared to those without itching. However, no association was found between itching and previously reported factors such as  $\beta_2$ -microglobulin, calcium, phosphorus, and [parathyroid hormone](#).

These results demonstrate an association between PBUTs and itching in hemodialysis patients. Dr. Yamamoto explained that the decreased frequency of itching compared to past reports may be attributed to advancements in treatments such as those involving calcium and phosphorus. The improvement of the removal of PBUTs with dialysis treatment may be beneficial to treat itching in hemodialysis patients.

**More information:** Suguru Yamamoto et al, Pruritus and protein-bound uremic toxins in patients undergoing hemodialysis: a cross-sectional study, *Clinical Kidney Journal* (2024). [DOI: 10.1093/ckj/sfae007](https://doi.org/10.1093/ckj/sfae007)

Provided by Niigata University

Citation: Unveiling uremic toxins linked to itching in hemodialysis patients (2024, February 19) retrieved 29 April 2024 from <https://medicalxpress.com/news/2024-02-unveiling-uremic-toxins-linked-hemodialysis.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.