

# Small change in blood acidity could prove detrimental to kidney disease patients

5 January 2015, by Morwenna Grills

(Medical Xpress)—A University of Manchester scientist has discovered that very small changes in the level of acidity in blood may have a detrimental impact on the health of patients with kidney disease.

Chronic Kidney Disease (CKD) is common in the UK. It is estimated that about one in five men and one in four women between the ages of 65 and 74 has some degree of CKD. The leading single cause of CKD is diabetes which is increasing so it's expected that more [patients](#) will be diagnosed with CKD in the future.

Dr Donald Ward from the Faculty of Life Sciences has been studying the impact of kidney disease on the body. He has found that very small changes in the pH (acidity) level in the [blood](#) prevents the body from being able to accurately monitor calcium levels. This leads to too much of the hormone PTH being released which is likely to lead to a greater risk of calcium and phosphate from the bone damaging the arteries. This often proves fatal to patients with CKD. His research has been published in the *Journal of the American Society of Nephrology*.

He says: "It was not realised before that the blood pH changes we see in patients with [kidney disease](#) can have an impact on their ability to monitor blood [calcium levels](#). My research has demonstrated that the effect of those changes may be more significant than previously thought and thus might need to be looked at more carefully by clinicians."

Dr Ward's research focussed on the high level of parathyroid hormone (PTH) in patients suffering from CKD. This causes the body to release calcium and phosphate from the bones which can then damage their blood vessels.

Dr Ward explains why this is so harmful: "The diseased kidneys prevent the body getting rid of both excess phosphate and excess acidity. So if

that acidity also causes the body to release more PTH then this could compound the problem by releasing further phosphate from the bone. This vicious circle might accelerate the potentially fatal calcification of the arteries."

He continues: "What is so important about this research is that we have demonstrated that changes in PTH release can be prompted by very small changes in blood pH level. Before, it was assumed that only a larger change in acidity would cause problems for patients."

The research was funded by Kidney Research UK. Elaine Davies, Director of Research Operations, from the charity says: "Donald's work has used novel pharmacological and molecular tools in generating these new findings which increase our knowledge about the complex balance that clinicians need to consider when treating patients with CKD."

Dr Ward is hoping to take his research to the next step, testing for therapeutic targets that could lead to better treatments for CKD.

**More information:** "Pathophysiologic Changes in Extracellular pH Modulate Parathyroid Calcium-Sensing Receptor Activity and Secretion via a Histidine-Independent Mechanism" *JASN* ASN.2014070653; published ahead of print January 2, 2015, [DOI: 10.1681/ASN.2014070653](https://doi.org/10.1681/ASN.2014070653)

Provided by University of Manchester

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