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## **Air Pollution can cause kidney disease**

**It is well known that air pollution causes lung cancer, weakens the lung function or triggers asthma. There is also evidence that there is an association between air pollution and birth defects, immune defects or even autism. Besides, people living in polluted environments seem to have more cardiovascular diseases. Now a new review article published in CKJ assembles evidence about air pollution´s impact on the incidence of kidney diseases. It showed that polluted air harms the kidneys, too, even if the mechanisms are still not fully understood.**

The result of the review by Baris Afsar, Turkey, and his international colleagues [1] is surprising. The review analyzed all relevant scientific articles of the past 30 years and came to the result: Polluted air does not only harm the upper and lower respiratory airways, but also impacts inner organs like the kidneys. Although research in this field has been rather new, the authors draw the conclusion that air pollution harms the kidneys. They emphasize that air pollution may be a novel environmental risk factor for CKD. This insight is of utmost importance, because chronic kidney diseases (CKD) cause at least 2.4 million deaths per year and are now the 6<sup>th</sup> fastest growing cause of death [2].

Why can air pollution affect the kidneys? On the one hand, polluted air contains heavy metals like cadmium, lead or mercury – and all of them are known to cause kidney disease. But also the “normal” traffic air pollution is nephrotoxic. One of the analyzed studies showed that patients living closer to a major roadway had a reduced kidney function compared to people who lived farther away. Many studies have shown a direct link between particulate matter and CKD. One which had a high statistic power according to the review authors showed that higher concentrations of particulate matter, carbon monoxide and nitrogen dioxide is associated with an increased risk of incident CKD, decline of kidney function and end stage renal disease.

But how can air pollution harm the kidneys? Professor Alberto Ortiz, CKJ´s editor-in-chief and co-author of the review, explains: “One hypothesis is that inflammatory mediators induced by polluted air in the lungs spill over into the circulation, resulting in systemic

inflammation, oxidative stress and damage to distant organs including the kidneys. Besides, there might also be a direct harming effect." As Ortiz points out, the pathogenesis is not fully understood and further research is needed. "We do not know in detail which underlying mechanisms cause the harm of the kidneys, but the evidence is very strong that air pollution has a long-term effect on the onset of CKD."

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[1] <https://academic.oup.com/ckj/advance-article/doi/10.1093/ckj/sfy111/5162583>  
[2] <https://www.worldkidneyday.org/2019-campaign/2019-wkd-theme/>

#### **About ERA-EDTA**

With more than 11,000 members, the ERA-EDTA ("European Renal Association – European Dialysis and Transplant Association") is one of the biggest nephrology associations worldwide and one of the most important and prestigious European Medical Associations. It supports basic and clinical research in the fields of clinical nephrology, dialysis, renal transplantation and related subjects. It also supports a number of studies as well as research groups and has founded a special "Fellowship Programme" for young investigators as well as grant programmes. In order to involve young nephrologists in all its activities, ERA-EDTA has created the "Young Nephrologists' Platform" (YNP), a very active committee whose board includes members who are 40 years old or younger. In addition, it has established various working groups to promote the collaboration of nephrologists with other medical disciplines (e.g. cardiology, immunology). Furthermore, a "European Renal Best Practice" (ERBP) advisory board was established by the ERA-EDTA to draw up and publish guidelines and position statements. Another important goal of the ERA-EDTA is education: The series of CME courses combined with the annual congress offer an attractive scientific programme to cover the need for continuous medical education for doctors working in the fields of nephrology, dialysis and transplantation. The association's journals, NDT (Nephrology, Dialysis, Transplantation) and CKJ (Clinical Kidney Journal), are currently the leading nephrology journals in Europe; furthermore NDT-Educational is the Society's online educational journal, with free access for all users, as well as being a very important and useful feature of the NDT-Educational "Literature Review". The ERA-EDTA Registry is a large epidemiologic database comparing countries by assessing nephrology practices throughout Europe. ENP, the European Nephrology Portal, is the latest new initiative of ERA-EDTA, where all those interested in the activities of the Society can find everything that is happening, all in one place. Finally, ERA-EDTA is a member of the European Kidney Health Alliance (EKHA), a consortium of patients, nurses and foundations relating to renal issues that actively interacts with the European Parliament. For more information, please visit [www.era-edta.org](http://www.era-edta.org)