

Environmental Pollution and Chronic Kidney Disease

A review.

Author: Ayuk Arrey Tabot

Co Authors: Eben Sorti Guy, Abena Peter Tabi, Iyasse Raissa, Ngedima Peter, Bisong Elvis Mbongoya, Bongben Claudette Vernyuy.

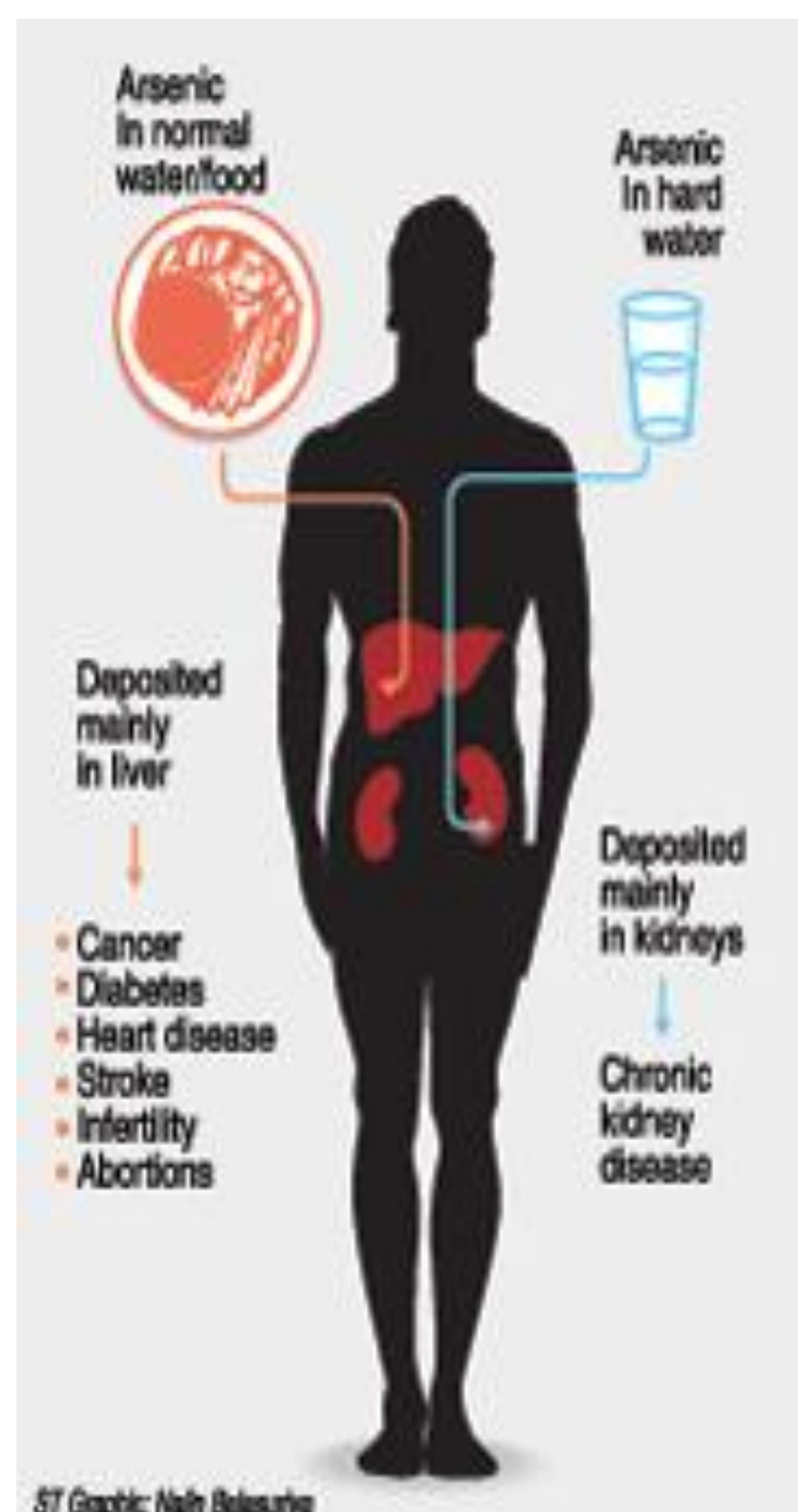
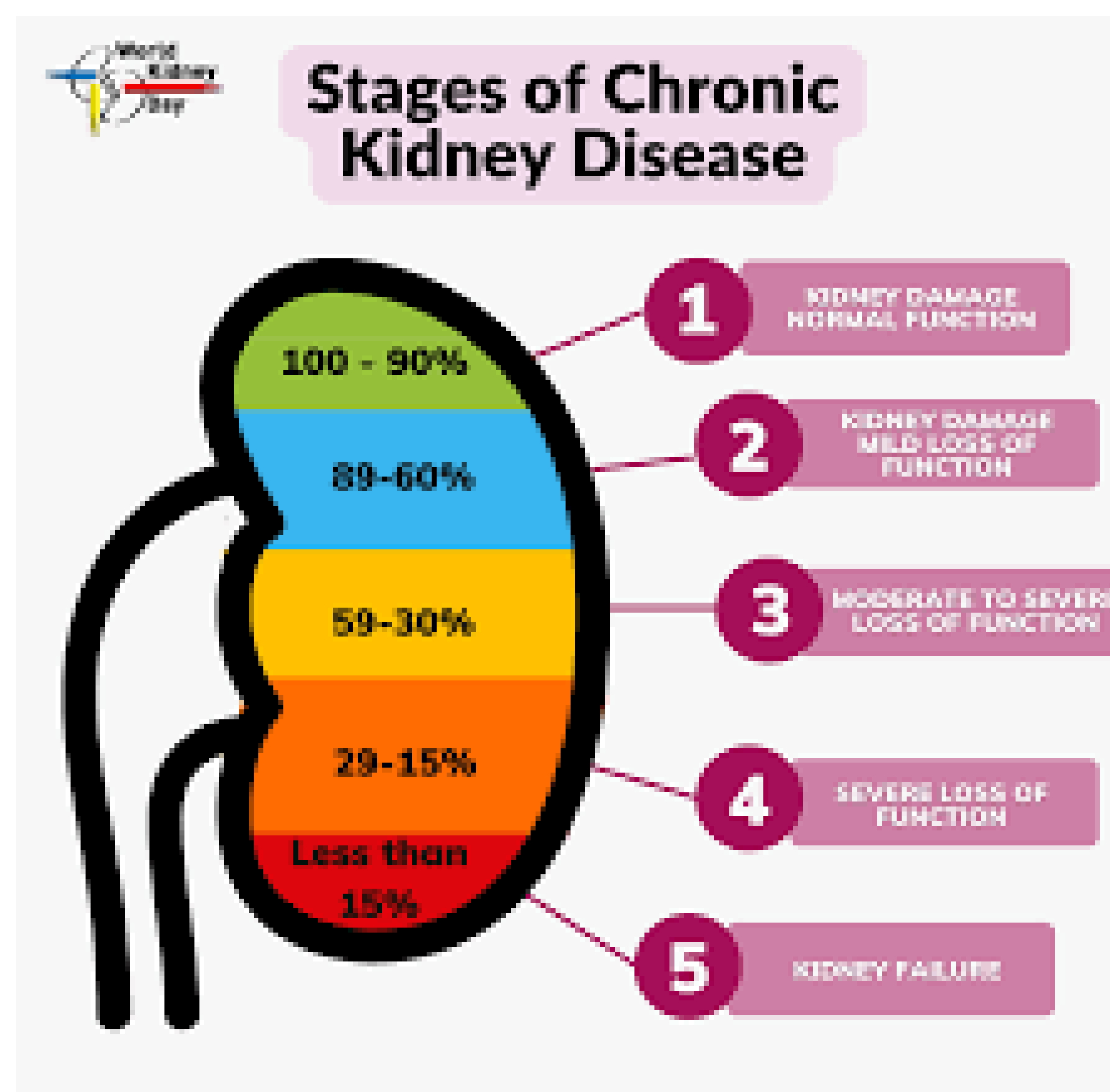
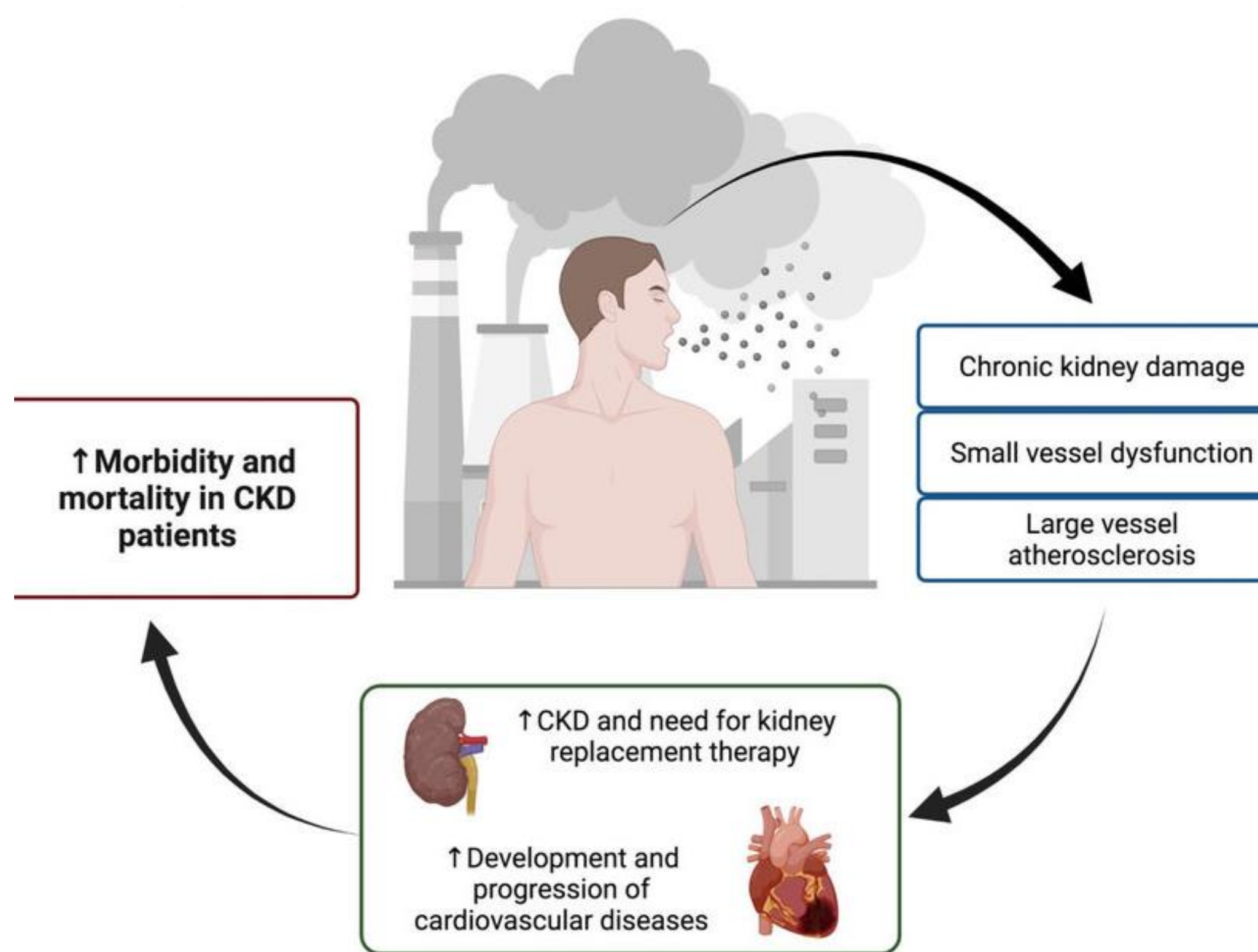


Introduction

Pollution is defined as hazardous unwanted contaminants released in the air, land, and water globally. - environmental pollution globally is directly related to several diseases. - in 2019 there were 9 million premature deaths recorded due to air pollution alone. - one impactful and fatal association is with chronic kidney disease

Methods

This systematic review establish a direct relationship between chronic kidney disease and environmental pollution by utilising existing studies. all papers that included chronic kidney disease and environmental pollution were filtered by using the BOOLEAN operators in libraries such as Google Scholar, PubMed, and Cochrane Library. The data collected was tabulated and analysed for statistical



Results

Various associations from analysis of previous studies

1. Consumption of contaminated water, which was polluted with arsenic resulted in renal injury and hypertension, which in turn increased the incidence of chronic kidney.
2. Lead a toxic element in the environment that heavily depends on kidneys for excretion. Some of the studies that were analyzed revealed that acute lead intoxication results in proximal tubular dysfunction and results in CKD
3. Air pollution contains contaminants such as sulphates, nitrates, and other metals that cause the decline of glomerular function and increase the incidence of CKD. 4. Some studies have shown the relationship between particulate matter (PM) in air and risks of CKD disease progression.

Conclusion

Chronic Kidney disease is a major cause of death around the globe. Environmental pollution has several denominations and unsurprisingly most of these pose a direct risk to the kidneys and result in chronic kidney disease. In this review, it was identified that several such toxins in air, land, and water are ingested due to environmental exposure and processed by kidneys for excretion. Prolonged exposure to these toxins has had a greater impact on increasing the incidence of chronic kidney disease. Environmental pollution poses a grave threat to human kidneys, therefore further research is warranted.

References

1. Pollution and health: a progress update Fuller, Richard et al. The Lancet Planetary Health, Volume 6, Issue 6, e535 - e547. [https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196\(22\)00090-0/fulltext](https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(22)00090-0/fulltext) (Accessed: 12 April 2024).
2. Hamroun A, Camier A, Bigna JJ, et al. Impact of air pollution on renal outcomes: a systematic review and meta-analysis protocol. *BMJ Open* 2021;11:e041088. doi: 10.1136/bmjopen-2020-041088
3. Shubham S, Kumar M, Sarma DK, Kumawat M, Verma V, Samartha RM, Tiwari RR. Role of air pollution in chronic kidney disease: an update on evidence, mechanisms and mitigation strategies. *Int Arch Occup Environ Health*. 2022 Jul;95(5):897-908. doi: 10.1007/s00420-021-01808-6. Epub 2021 Oct 30. PMID: 34716808.
4. Rastogi SK. Renal effects of environmental and occupational lead exposure. *Indian J Occup Environ Med*. 2008 Dec;12(3):103-6. doi: 10.4103/0019-5278.44689. PMID: 20040966; PMCID: PMC2796746.
5. Zheng L, Kuo CC, Fadrowski J, Agnew J, Weaver VM, Navas-Acien A. Arsenic and Chronic Kidney Disease: A Systematic Review. *Curr Environ Health Rep*. 2014 Sep 1;1(3):192-207. doi: 10.1007/s40572-014-0024-x. PMID: 25221743; PMCID: PMC4159179.