



Meta-analysis of AKI-CKD Transition in Perioperative Patients

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Background

Patients who develop AKI experience higher risk of developing CKD than the general population and patients who do not develop AKI (Coca, et al. 2012). Recent data suggests that anesthetic or operative management may influence long term complications following surgery. For example, surgical exposure associates with cognitive decline in older adults, and pediatric exposure to general anesthetics causes long-term behavioral change. Therefore we explored the relationship between perioperative AKI and progression to CKD.

Hypothesis

Perioperative patients experience differential risk of AKI to CKD transition compared to non-perioperative patients.

Methods

MEDLINE search terms

- AKI, CKD, chronic renal insufficiency, burns, nephrotoxins, sepsis, systemic inflammatory response, myocardial ischemia, heart arrest, cardiovascular, surgical procedures, cardiovascular system, and cardiovascular diseases

Statistical analysis

- Analysis conducted using R package metafor
- Odds ratio (OR) calculated for each study
- Random effects model used to compute each weighted OR and subgroup ORs
- Leave-1-out and funnel plots used to assess effect of heterogeneity and publication bias

Results

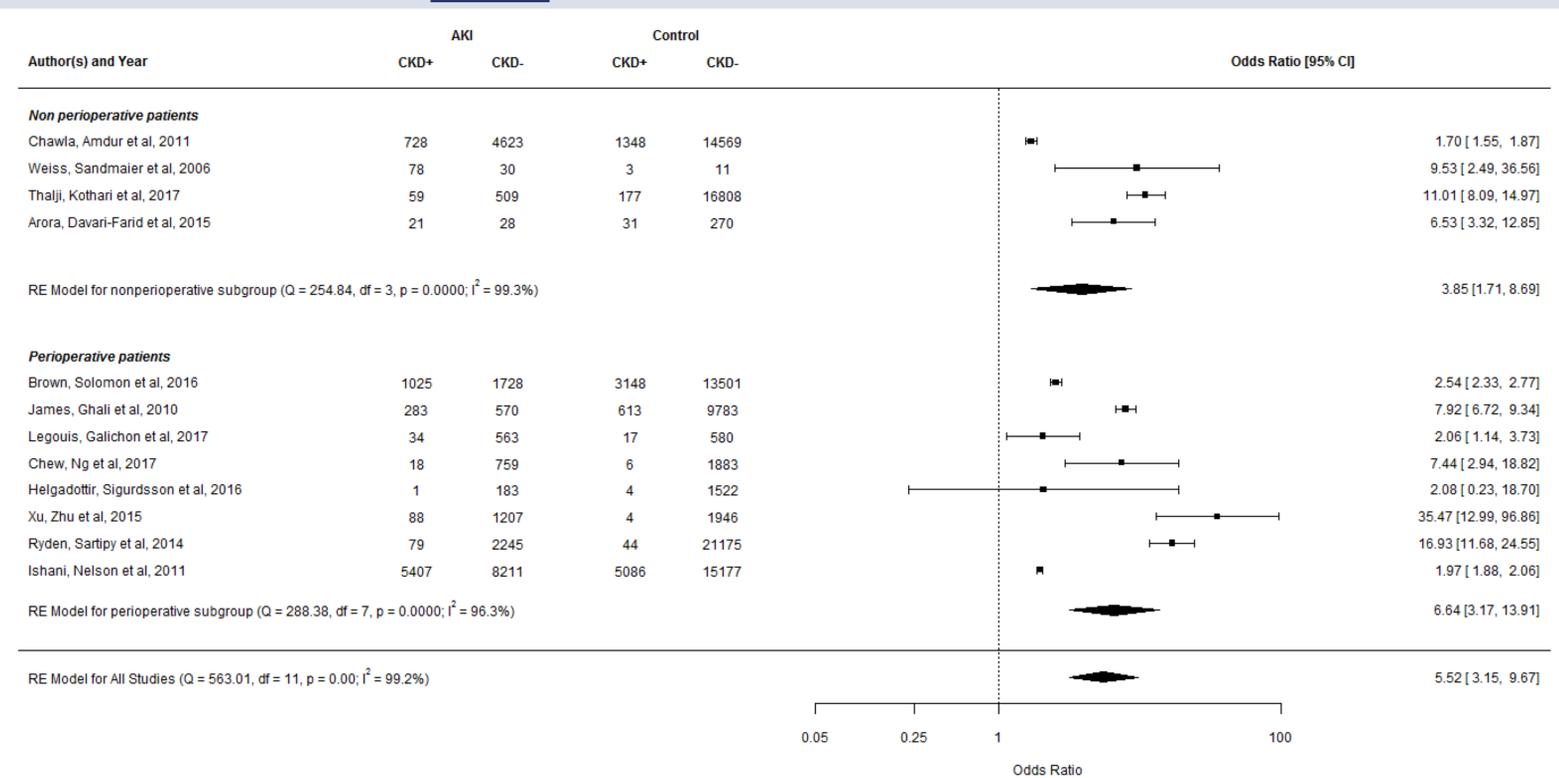


Figure 2. Forrest plot of all studies with subgroup analysis

Methods

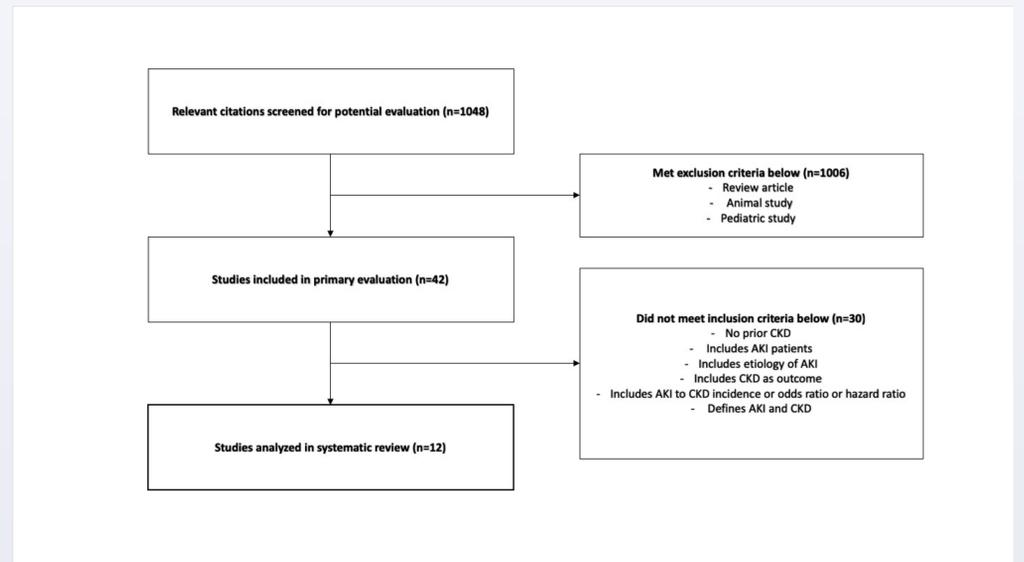


Figure 1. Stepwise process for study selection

Results

Non-perioperative studies included studies of oncology, percutaneous coronary intervention, and myocardial infarction. Perioperative studies included those conducted in patients from cardiac surgery, vascular surgery, and burns. Studies of non-perioperative populations demonstrated OR 3.85 [1.71-8.69] whilst studies of perioperative patients demonstrated OR 6.64 [3.17-13.91].

Conclusion

Patients experiencing perioperative AKI may be at higher risk for progression to CKD than patients who develop non-perioperative AKI.

References:

Coca, Steven G., Swathi Singanamala, and Chirag R. Parikh. "Chronic kidney disease after acute kidney injury: a systematic review and meta-analysis." *Kidney international* 81.5 (2012): 442-448.