INTRODUCTION AND AIMS: Recent studies have shown that exposure to polluted air is remarkably associated with increasing incidence of membranous nephropathy, coronary heart disease and chronic obstructive pulmonary disease. Patients with end-stage renal disease (ESRD) are of higher risk of cardiovascular events and mortality than general population. Whether air pollution negatively impacts the prognosis of ESRD patients remains unclear. Therefore, a systematic review was conducted to evaluate the evidences from observational studies to address this issue.

METHODS: Observational studies that contained ESRD population and addressed the relation between long-term exposure to air pollutants and mortality were included. CENTRAL, EMBASE, MEDLINE, PUBMED, and WEB OF SCIENCE were searched up to January 2017. Study screening, data extraction and quality assessment (Newcastle-Ottawa Scale) were performed independently by two researchers.

RESULTS: The search identified 252 studies and 3 cohort studies were eligible. All of the included studies reached the maximum score of the Newcastle-Ottawa Scale. Due to the clinical heterogeneity of study population and exposure types, quantitative synthesis was inapplicable. One study included 32,239 adult kidney transplant recipients showed that the risk of fatal coronary heart disease (CHD) increased by 34% (relative risk [RR], 1.34; 95% CI, 1.03-1.76) for each 10-ppb increase in ozone after 7-year follow-up. Another study included 160 peritoneal dialysis patients and followed up for 2 years. It showed that exposure to high concentration of environmental nitrogen dioxide (NO2) were associated with higher risk of mortality (hazard ratio [HR], 3.776; 95% CI, 1.143-12.47). The last study included 256 hemodialysis patients and categorized based on living environments, which found the risk of mortality increased in the high air pollution (particulate matter <2.5 μm [PM2.5] in diameter, carbon monoxide [CO] and NO2) exposure group (HR, 1.762; 95% CI, 1.054-2.947) with a 2 years follow-up.

CONCLUSIONS: In the ESRD patients who receiving RRT, long-term exposure to air pollutants is associated with higher risk of mortality. Appropriate precautions may be needed for this subgroup of patients.