Relationship between exposure to radon and the risk of lung cancer; Systematic review and meta-analysis updated to 2015

Abstract

Radon 222 is a radioactive isotope with a half-life of 3.825 days, which is colorless and odorless and it endangers human health in the long run by emitting alpha radiation during the decay. Many studies have been done on the effects of inhaling Radon on lung cancer risk and most studies show that inhalation of radon increases the risk of lung cancer. Therefore, in this study, it has been tried to provide accurate results on the relationship between the inhalation of Radon and the risk of lung cancer by adding new case-control studies performed by 2015. The databases of ISI, Pubmed, Scopus, Iran doc and SID were used to find the studies in Iran and the world. The studies were searched from 1990 to 2015 with the use of checklist STROBE. The studies which obtained the least score, were entered at the stage of meta-analysis. The quality of the studies was determined based on system scale Newcastle – Ottawa. 24 papers (24 case-control studies), totally 50784 participants (20138 cases and 30646 controls) were specified. The measurement period was between 3 to 12 months. The mean concentration of Radon that the cases were exposed was 103.4±54 and 80.3±44 Bq/m³. The meta-analysis of 24 case-control studies showed that there is a significant relationship between the exposure to radon and the risk of lung cancer (OR=1.46, 95% CI (1.23-1.72), P value<0.001). Also, the heterogeneity of the studies was high (I²=65%, p=<0.001). Egger’s test showed that (Beta:1.43, 95%(0.7-2.12) there was a significant error propagation between the studies (p value<0.001). The results of this study support the increased risk of lung cancer caused by the inhalation of radon. © 2016, International Journal of Pharmacy and Technology. All rights reserved.