Background: Chronic obstructive pulmonary disease (COPD) is a syndrome of progressive airflow limitation caused by the abnormal inflammatory reaction of the airway and lung parenchyma. Osteoporosis is one of the major extrapulmonary manifestations of COPD. The prevalence of osteoporosis in COPD patients in Iraqi population is unknown.

Objectives: To study the incidence of osteoporosis among COPD patients and its relations to various risk factors.

Materials and Methods: The study was done in Baghdad Teaching hospital. All the diagnosed cases of 70 COPD patients according to the GOLD guidelines were included in this study. The present study was a cross sectional study during a period of August 2014 - October 2015. A brief history of the patients was taken, especially regarding duration of illness, number of exacerbations in the past 3 years, smoking in pack years, and history of steroid use (both systemic and inhaled steroids) after which cumulative dose of steroids was calculated.

Spirometry was done in all these patients to stage the severity of COPD according to GOLD criteria. DEXA scan of the lumbar spine was done using bone densitometer to determine osteoporosis. (WHO) criterion for definition of
osteoporosis was applied and patients with T-score of below $-2.5$ standard deviation (SD) were diagnosed to have osteoporosis, $-1$ SD to $-2.5$ SD were diagnosed to have osteopenia and more than $-1$ SD as normal. Results: A total of 70 COPD patients were included in this study, Among these, 36 patients (51.4%) had osteoporosis and 23 patients (32.8%) had osteopenia. Majority (94.4%) of the patients who had osteoporosis had stage III and stage IV COPD disease. It was observed that as the severity grade of COPD increased, the risk of osteoporosis also increased. The bone mineral density (BMD) showed a significant difference among different stages of COPD. It was also observed that patients with lower body mass index (BMI) had higher prevalence of osteoporosis (91.7%) as compared to overweight patients. On univariate analysis, it was observed that risk factors for osteoporosis were female sex, higher number of exacerbations, BMI, and severity of COPD. After using multivariate analysis, stage IV COPD, number of acute exacerbations $>3$ in the previous 3 years, and steroid cumulative dose $>1000$ mg were observed to be significant risk factors for osteoporosis in COPD patients.

VII Conclusions: In the present study, the osteoporosis was high incidence more than 50% and for osteopenia was less incidence (32.8%). As the severity of COPD increased, the risk of osteoporosis increased. Low BMI, use of systemic steroid, and repeated number of exacerbations were found to be significant risk factors for osteoporosis in COPD patients.