**Introduction:**
Acute renal failure (ARR) is a common complication in ICUs and usually caused by hypoperfusion. ARF induced by hypoxemia is a concept rarely reported in ICU. Its incidence and pathogenesis are not well understood. We aimed to study the relationship between hypoxemia and the occurrence of ARF.

**Methods:**
Retrospective cohort study including patients with hypoxemia whatever its etiology between January 2016 and August 2019. Patients with chronic renal failure were excluded. ARF was defined and ranked according to the KDIGO criteria 2012. Arterial blood gas, urea, creatinine and clearance were reordered on the first, third and seventh days of evolution.

**Results:**
50 patients were included and 2 groups were obtained: group of hypoxemic patients with ARF (ARF+, n=30): versus group of hypoxemic patients without ARF (ARF-, n= 20). The incidence of hypoxemie-induced ARF was therefore 60%. Clinical characteristics were comparable in both groups with a mean age of 47 ± 16 and a sex ratio of 1.77.

The comparative study showed in ARF+ group: a lower pH (7.20 [7.8-7.33] vs.7.34 [7.27-7.41], p = 0.003) and a higher C reactive protein (CRP) in the same group (201 [129.75-325.75] vs. 117.5 [29.5-225.25], p = 0.023). The most significant correlation was showed with MDRD clearance at day 3 and P/F ratio at day 1 (Rho = 0.338, p = 0.038).

Multivariate analysis found that septic shock and non invasive ventilation in hypoxemic patients were the factors related to ARF with respectively OR=11.08, 95% CI=1.56-83.84, p=0.016 and OR=6.18, 95% CI=1.16-34.07, p=0.033. Overall mortality was 68% (n=34) and ARF was an independent factor of mortality:  OR=6, and 95% CI=1.35-26.64, p = 0.017.

**Conclusion:**
Hypoxemia-induced ARF is a common complication associated with excess mortality. Our study suggests that renal function is correlated with the degree of hypoxemia and that this correlation is rather distinct 48 hours from hypoxemia.