Introduction:
Mitochondrial DNA (mtDNA) contains demethylated CpG sequence that activate inflammatory reaction in the engine body. There is still no research about the role of mtDNA in the occurrence of ARDS. This study is to observe mtDNA level in plasma of patients with ARDS and judge its value in predicating ARDS severity degree and prognosis.

Methods:
We conducted a prospective study, in which from 1 May 2016 to 31 January 2017, patients diagnosed ARDS who meet the inclusion criteria were recruited into the study from the department of critical care medicine Zhongda Hospital, Southeast University. Demographic, clinical data, severity indices were recorded and blood plasma samples were subsequently collected. The enrolled day is defined as day 1. mtDNA levels in plasma on Day 1, Day 3 and Day 7 were evaluated by quantitative real-time PCR. The predictive values was determined in ARDS patients using the ROC analysis.

Results:
One hundred thirty-six patients with ARDS were prospectively collected, 73 patients were enrolled finally. Among them, 29 (39.7%) died within 28 day after admission. Median plasma mtDNA level of mild, moderate and severe ARDS patients were [1230, IQR: 588-22387 vs. 5370, 628-13052 vs. 15792, 1623-186814 copies/µL; P < 0.05]. Median plasma mtDNA level of ARDS patients who died within 28 days was significantly higher than the survivors (67608, IQR: 19498-346736 vs. 7585, 1717-15792 copies/µL; P < 0.05). The plasma mtDNA level on day 1 and day 3 had no predictive value for prognosis, while the value on day 7 has. The optimal cutoff value on day 7 for mortality was 18640 copies/µL, of which the sensitivity, specificity for predicting mortality were 76.5% and 76.9%. Compared with the PaO2/FiO2, mtDNA has similar prognostic value in patients with ARDS.

Conclusion:
mtDNA levels on Day 7 were significantly associated with ARDS patients’ 28-day mortality.