A652 - Derivation of "specific population who could benefit from rosuvastatin": a secondary analysis on randomised controlled trial to uncover novel value of rosuvastatin for precise treatment of ARDS

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Introduction:
The high heterogeneity of ARDS contributes to paradoxical conclusions from previous investigations of rosuvastatin for ARDS. Identification of the population (phenotype) who could benefit from rosuvastatin is a novel exploration for precise treatment of ARDS.

Methods:
The patient population for this analysis consisted of unique patients with ARDS enrolled in the SAILS trial (Rosuvastatin vs. Placebo). Phenotypes were derived using consensus k means clustering applied to routinely available clinical variables within 6 hours of hospital presentation before receiving placebo or rosuvastatin. Kaplan–Meier statistic was used to estimate the 90 day cumulative mortality for screening specific population who could benefit from rosuvastatin, with cut-off value as P <0.05.

Results:
The derivation cohort included 585 patients with ARDS. Of the 4 derived phenotypes, phenotype 3 was identified as "specific population who could benefit from rosuvastatin" since rosuvastatin resulted in a significant reduction in 90 day cumulative mortality for ARDS (hazard ratio [HR] 0.29 [95% CI 0.09, 0.93]; P=0.027). Meanwhile, there were no significant differences in baseline characteristics between those assigned to rosuvastatin and those assigned to placebo. Additionally, rosuvastatin markedly improved the free of cardiovascular failure (10.08±3.79 in Rosuvastatin group vs 7.31±4.94 in Placebo group, P=0.01) and coagulation abnormality (13.65±1.33 vs 12.15±3.77, P=0.02) to day 14 in phenotype 3. Patients classified as phenotype 3 exhibited but not limited to the relative higher platelet count (390.05±79.43×10^9/L), lower CRP (20.23±11.99μg/L) and Creat (1.42±1.08 mg/dl), compared with patients classified as other phenotypes.

Conclusion:
This secondary analysis of SAILS trial identified the specific population who can benefit from rosuvastatin using machine learning applied to clinical variables at the time of hospital presentation, which uncovered a novel value of rosuvastatin for the treatment of ARDS.
Kaplan–Meier survival curves of 90 day cumulative mortality for 4 phenotypes between patients receiving Rosuvastatin and patients receiving placebo.