Introduction:
Subarachnoid hemorrhage (SAH) is a serious life threatening disease associated with high mortality and morbidity. A substantial number of patients develop systemic inflammatory response syndrome (SIRS). Here we aimed to identify risk factors for SIRS development and to evaluate the role of SIRS-burden on patients’ outcome.

Methods:
Prospectively collected data from 297 consecutive non-traumatic SAH patients admitted between 2010-2017 were analyzed. SIRS was diagnosed based on ≥2 criteria (hypo/hyperthermia, tachypnea, leukopenia/leukocytosis, tachycardia) and defined as early (≤3d) and delayed SIRS (d6-d10). SIRS-burden was defined as the percentage of SIRS-positive days within the first 10d. Multivariate analysis was used to analyze risk factors for the development of early and delayed SIRS as well as the relationship of SIRS with poor functional outcome [3-month modified Rankin Scale (3m-mRS)≥3].

Results:
78% of SAH patients had early SIRS and 69% delayed SIRS. Median SIRS-burden within the observation period of 10d was 60% (IQR=10-90%). Risk factors for early SIRS were poor admission grade (OR=1.74, 95%-CI=1.12-2.72, p=0.013), aneurysm clipping (OR=6.45, 95%-CI=1.35-30.81, p=0.019), hydrocephalus requiring EVD placement (OR=3.04, 95%-CI=1.02-9.03, p=0.046) and a higher modified Fisher Scale score (OR=1.78, 95%-CI=1.19-2.64, p=0.005). Patients with early SIRS were at increased risk to develop delayed SIRS (OR=3.54, 95%-CI=1.32-9.51, p=0.012). With every 1 point increase of the SIRS score patients had a 1.7 higher odds for poor functional outcome (95%-CI=1.33-2.11, p<0.001). SIRS-burden had the highest predictive value for outcome compared to early and delayed SIRS (p=0.002).

Conclusion:
SIRS is common after SAH and significantly contributes to poor functional outcome independently of established risk factors. SIRS is more frequent in poor admission grade SAH patients and patients undergoing aneurysm clipping. SIRS-burden may more accurately predict poor functional outcome than early SIRS alone.