Background: The recently published LOOP Study was a randomized controlled clinical trial to evaluate systematic atrial fibrillation (AF) screening with long-term continuous monitoring in an elderly population at risk and found no significant reduction in stroke. However, the screening effects seemed to differ across levels of systolic blood pressure (SBP). It is well-known that hypertension constitutes a prominent risk factor for clinical AF and stroke alike, but data on the impacts of SBP on subclinical AF and hereby AF screening efficacy are lacking.

Purpose: With this post hoc analysis of the LOOP Study, we aimed to provide insights into the interaction between SBP and benefits of systematic AF screening.

Methods: The LOOP Study randomized individuals aged 70-90 years with ≥1 stroke risk factor (hypertension, diabetes, heart failure, or previous stroke) and without prior AF to either monitoring with implantable loop recorder (ILR) and initiation of oral anticoagulation upon detection of new-onset AF episodes lasting ≥6 minutes, or usual care (control group). In total, 5997 participants with available SBP measurements at enrolment were included in the present analysis. The interaction between SBP and ILR screening efficacy on stroke or systemic arterial embolism (SAE), as indicated by hazard ratio (HR) for ILR versus control, was assessed with polynomial moving-average regression. The lowest SBP threshold with significant screening benefits was further determined and used to examine clinical outcomes and the occurrence of AF with respect to dichotomized SBP. Additionally, penalized spline models were employed to assess AF occurrence by SBP as a continuous variable.

Results: HR of stroke/SAE for ILR versus control decreased with increasing SBP and the lowest threshold for significant screening benefits was at SBP ≥150 mmHg. ILR screening of participants with SBP ≥150 mmHg yielded a 45% risk reduction of stroke/SAE (HR 0.55 [0.37-0.82]). Within the ILR group, SBP ≥150 mmHg was associated with an increased risk of AF episodes ≥24 hours as compared to lower SBP (HR 1.57 [1.01-2.45]), but not with the overall occurrence of AF (HR 1.14 [0.95-1.36]). No significant association between SBP and AF occurrence in the ILR group was reported in penalized spline models either (p-value: 0.73).

Conclusions: The benefits of ILR screening for AF on stroke/SAE increased with increasing blood pressure. SBP ≥150 mmHg was associated with a 1.5-fold increased risk of AF episodes ≥24 hours, along with an almost 50% risk reduction of stroke/SAE by ILR screening.