**Delirium in octogenarians undergoing cardiac surgery or implantation**

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**Background and Aims**

A high mortality rate is expected in untreated aortic stenosis (AS) patients when symptoms in form of angina, syncope and heart failure develop. Surgical aortic valve replacement (SAVR) is the gold standard surgical treatment for AS. Yet, its operative risk might be too high in elderly patients with coexisting conditions. Transcatheter aortic valve implantation (TAVI) is an option to patients without reasonable surgical alternatives. Many patients undergoing TAVI are 80 years and older.

Old patients undergoing cardiac surgery often develop postoperative delirium (PD), an acute state of confusion characterized by temporarily and fluctuating decline in attention and cognition. Knowledge about octogenarians undergoing invasive cardiovascular therapy is scarce, and PD after TAVI remains to be explored. Therefore, the aims of this project are to i) identify incidence, risk factors and possible differences in the course and onset of postoperative delirium in octogenarians accepted for SAVR or TAVI, ii) determine the impact that delirium has on activities of daily living (ADL), instrumental activities of daily living (IADL), cognitive function and self-reported health status, and iii) investigate if the absence of delirium, anxiety and depression can predict event-free survival.

**Methods**

This is a prospective cohort study of patients with AS accepted for TAVI or SAVR. Inclusion criteria: age 80+ and previous acceptance for TAVI or SAVR. Exclusion criteria: inability to speak Norwegian and denied consent to join the study. Baseline data was collected the day before treatment, and follow-up was done one and six months later. The incidence of PD was measured for five postoperative days with the Confusion Assessment Method (CAM). Barthel Index and Nottingham Extended Activities of Daily Living Scale were used to study ADL and IADL. Cognitive function was measured with the Mini Mental State Examination (MMSE) and self-reported health status with SF-12. Changes between baseline and follow-up were established with Student t-test or Mann-Whitney test. Logistic regression analysis was used to identify risk factors for PD and to determine its impact. Event-free survival will be investigated with Kaplan-Meiers analysis and Cox regression.

**Results**

Between 2011 and 2013, 143 patients with a mean age of 83.5 years (SD 2.7) were included. TAVI was performed in 46% of them. In Study I, we identified a lower incidence of PD in patients undergoing TAVI compared to SAVR (44% vs. 66%). Low cognitive function and SAVR emerged as risk factors for PD. Differences in the onset and course of PD between treatment groups were established and described. In Study II, we were able to determine the negative impact that PD has in ADL and IADL function 1 month after treatment, but not after 6 months. Results of Study III are yet to be determined.

**Preliminary conclusions**

The incidence of PD among octogenarians undergoing aortic valve replacement (AVR) is high, especially in patients treated with SAVR. In octogenarian AS patients, SAVR might be considered a predisposing risk factor for PD. Our data suggest that the onset of PD was more unpredictable after SAVR compared to TAVI. Negative consequences of PD on ADL and IADL function 1 month after treatment were identified, especially in TAVI patients. Cognitive function 6 months after AVR did not show any association with PD.