

**“Does congenital heart disease affect cognitive function? – A pilot study in adults with congenital heart disease”**

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**Objective**

It is often assumed, that adults with congenital heart disease (ACHD) have an impairment regarding their cognitive function. In particular it seems reasonable to assume that cyanosis as well as medical and surgical therapies could have potential impact on cognitive function in adulthood. However, currently there is no data regarding cognitive function formally assessed by intelligence tests in ACHD patients. Therefore, the aim of this study was to analyze the cognitive function and its association with cyanotic conditions in ACHD patients.

**Methods**

Forty-five ACHD patients (female n=20 (44.4%), mean age at assessment  $34.3 \pm 13.9$  years) underwent the Wechsler Intelligence Scale for adults (fourth edition) – a well-established assessment of cognitive function in adults - as inpatients between March-December 2017. In this test impairment is defined as an intelligence quotient achieved which is below more than one standard deviation of the norm.

**Results**

The mean overall intelligence quotient (oIQ) achieved by the patients was  $94.9 \pm 12.9$  points. Regarding the subgroups, the patients achieved  $97.7 \pm 13.1$  IQ points (IQp) in verbal comprehension,  $94.7 \pm 13.0$  IQp in working memory,  $94.7 \pm 14.1$  IQp in logical thinking, and  $96.7 \pm 12.1$  IQp in processing performance. Therefore, compared to the norm standard ( $\emptyset 100$  IQp) no impairment of cognitive function was present in the study cohort.

Patients with acyanotic CHD (n=15) achieved a mean oIQ of  $95.2 \pm 12.1$  points,  $96.8 \pm 12.4$  oIQ points in patients with corrected cyanotic CHD (n=24) and a mean oIQ of  $86.5 \pm 16.1$  points in patients who were still cyanotic (n=6). The difference between the groups was statistically not significant (p=0.277).

**Conclusions**

Contrary to the general assumption, ACHD patients showed no significant impairment in cognitive function compared to the norm. Nevertheless, a trend was shown that cyanotic patients had a lower overall IQ. Further studies in larger cohorts are needed to assess the impact of cyanosis and other possible confounding factors on cognitive function in this growing patient population. The aim would be to identify patients at high risk to allow targeted preventive strategies.