

### Age-related humoral and cellular human immune response after pulmonary valve implantation using xenografts in patients with congenital heart defects

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**Objectives:** Pulmonary valve implantation (PVI) led to a substantial increase in life expectancy for patients with congenital heart disease. Optimal valve function could be critically influenced by immune response related to the used xenograft material itself or related to the surgical or interventional transcatheter procedure (TPVI). Since immune response depends on immune maturity detailed age related analysis of this could help to understand clinical signs and advance the promising results of PVI.

**Methods:** At defined time points before and after preliminary stent implantation, TPVI or surgical valve replacement (SPVI) blood samples were analyzed for interleukins (12p70/1beta/2/6/8/10,TNF) (n = 33) and leukocyte analysis (n = 26). Patients were divided to five age groups (see table 1).

table 1: Age related number of patients

age in years	group I 0,5 to < 2	group II 2 to < 6	group III 6 to < 12	group IV 12 to < 18	group IV 18 to 55
cellular					
pre-stenting & TPVI	n= 0	n= 0	n= 3	n= 2	n= 3
SPVI	n= 5	n= 6	n= 7	n= 0	n= 0
humoral					
pre-stenting & TPVI	n= 0	n= 0	n= 3	n= 3	n= 7
SPVI	n= 5	n= 7	n= 8	n= 0	n= 0

**Results:** Only IL 6 increased 72h after TPVI in group V up to 28 pg/ml without a significant difference compared to stent implantation. Leukocyte cell counts did not change after TPVI. Up to 4h after SPVI IL 10 increased in groups I (36 pg/ml), II (35 pg/ml) and III (41 pg/ml). IL2R raised later (24h after SPVI) in groups I (262 %), II (212 %) and III (186 %). For 72h after SPVI, PCT and IL 8 increased in groups II (936 and 12 pg/ml) and III (157 and 12 pg/ml). Group I revealed IL 8 elevation even up to 72h after SPVI (27 pg/ml). IL 6 was raised in all three groups for at least 72h. The older the patients the longer time was needed until normalization. Other IL did not differ from pre-values. Granulo-, Mono- and Lymphocytes reacted all after SPVI, granulocytes raised up to 7d after SPVI in groups I (209 %), II (433 %) and III (275 %). Monocytes increased in group I 24h after SPVI. Lymphocytes decreased in group II more and longer than in groups I and II (72h).

**Conclusions:** Immune response related to interventional or surgical pulmonary valve replacement differs to age and immune maturity. Explicit immunity patterns provoked by xenograft material were not apparent. Further Samples are needed to understand the different immune patterns in detail.