

**AV Channel is very rare in T21 patients at high altitude in Bolivia**

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**Introduction (or Basis or Objectives):** Down Syndrome (DS) children have a major cardiac anomaly, the most common being atrioventricular septal defects (AVSD) in regions below 1500 meters of altitude. Aim: To establish frequency and distribution of Congenital Heart Disease (CHD) in children with Down Syndrome (DS) at different altitudes above sea level in Bolivia.

**Methods:** Retrospective, descriptive study of echocardiographic examination of 595 children with DS performed with a standardized protocol. The patients were distributed in two groups, according with the residency altitude. G1 (n: 480): >3000 masl and G2 (n: 115): 1500-3000 masl.

**Results:** Between 2004 and 2016 we studied 5954 patients with suspicion of CHD, 595 of those were diagnosed with DS (10%). The mean age at diagnosis was 2,94 years. 390 (65,5%) patients had a CHD. Female patients with DS were more likely to have a cardiac anomaly compared to male patients. The male/female ratio was: 1,05:1. We also analyzed the frequency of CHD of each group: G1: 69,4% (n:333) and G2: 49,5% (n:57). The group 1 had higher prevalence of CHD. In all two groups the most frequent CHD were: VSD, PDA und ASD. The frequency of AV channel of each group was: G1: 0,8% (n:3), G2: 1,5% (n:6). The hemodynamic significance of CHD of each group at the moment of the study were: G1: 67% (n: 299), G2: 44,2% (n: 46). The association of cardiac malformations by altitude were: G1: 33,6% (n:112) and G2: 19,3% (n:11). Ductus arteriosus shows an increasing prevalence with altitude.

**Conclusions:** CHD frequency increases with altitude. AV Channel is not the most frequent CHD at high altitude in patients with DS, but associations of VSD, ASD and ductus are the most common finding. AV Channel seems to increase with lower altitude (G1: 0,8% vs G2: 1,5%). AV channel has a significant fewer frequency in Bolivian patients. More studies are needed to investigate if this difference with other populations is racial or due to hypoxia.

	<i>Our Data. 2017</i>	<i>Morris et al. 2014</i>	<i>Bell et al. 2003</i>	<i>Freeman et al. 1998</i>	<i>Stoll et al. 1990</i>	<i>Källén et al. 1996</i>
<b>Place</b>	Bolivia	Europe	England	Atlanta	France	Europe
<b>Study period</b>	2004-2016	2000-2010	1985-1999	1989-1995	1979-1987	1976-1993
<b>Number of cases with Down Syndrome</b>	595	6151	577	227	139	5581
<b>Percentage with CHD</b>	65,5	43,6	39,1	44	44,6	26
<b>AVSD</b>	2,3	23,2	43,4	45	41,9	38,5
<b>VSD</b>	36	24,3	28,8	35	29	28
<b>ASD OS</b>	19	N/A	N/A	8	N/A	N/A
<b>PDA</b>	35,6	1,6	16,8	7		3,6
<b>TOF</b>	0,5	2,7	3,5	4	3,2	3,5
<b>Coarctation of the aorta</b>	0,3	1,6	4	N/A	4,8	0,6
<b>Other</b>	6,3	18,5	4,7	1	14,5	26,4

Table 1: Comparison of frequency and CHD distribution in our study and in different populations