Two Studies Exploring Links Between Congenital Heart Disease (CHD) And Environmental Physical Activity, 1995-2005

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Background: Environmental physical activity is connected with many aspects of human homeostasis including fetal number, development and some genetic disorders. The **aim** of this study was to check links between monthly distribution of newborns with CHD in two separate geographic areas at the same time and Solar (SA), Geomagnetic (GMA), cosmic Ray (CRA) activity, year and month. (1-12).

Patients and methods: CHD in 1739 born live, 49.3% boys / 79085 births in two tertiary centers in Israel and 371- 44.98 % boys// 41435 births in Kaunas, Lithuania at 1995-2005 (132 months) were compared with 11 physical activity indices in both locations. In addition to total results at the month and year of delivery physical parameters reflecting the time of delivery and 9 months before were studied and the physical indices at the year of delivery and one year before, The effect of excluding PDA in one of the studies was additionally checked and gender differences in the second Pearson correlation coefficients r and their probabilities were calculated.

Results: It was a positive relationship of births and CHD, number in the Israeli ($r=0.32$ $p=0.0002$ fr CHD, $r= 0.83$, $p=0.0014$ for births) and negative in Kaunas ($r=-0.44$, $p<0.0001$ for CHD, $r=-0.9$, $p=0.00012$ for births) with year of observation., non significant links with month (.1-12).In both studies it was a correlation with physical factors at a year before delivery, with gender differences boys (n-178) more affected than girls (n=191). In both studies it was a significant relationship between CHD and SA and CRA, but inverse (positive in the Israeli cohort with SA, $r=0.5$, $p<0.0001$,inverse CRA and positive with CRA and inverse with SA in Kaunas , $r=04$, $p<.0001$, $r=-0.23$, $p=0.008$. In both locations one year before delivery the links with physical parameters were

Conclusion: the monthly number of CHD is related with environmental physical effects (SA, CRA). Some differences in the results in two locations can be related with inverse dynamics of yearly observed births in the compared places.

In this pilot gender observation boys were more affected by studied physical factors than girls. The precise mechanism of the described relationships needs special studies..