SCREENING CHILDREN FOR CONGENITAL AND STRUCTURAL HEART DEFECTS USING HD STETH AND ECHOCARDIOGRAPHY

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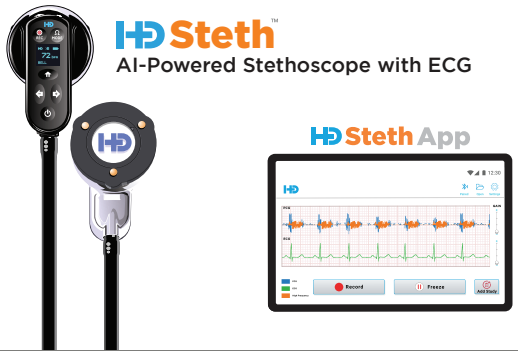
Introduction:

Congenital Heart Defects are defined as abnormal cardiocirculatory structure or function present from birth[1]. Congenital Heart Defects are the most common type of birth defect which affect nine in 1000 newborns globally[4]. One-Third to half the cases of congenital heart defects are critical and require intervention for the survival of the child[3]. The lack of access to a specialist and sophisticated technology in rural areas of India and other developing countries cause many such cases to go unnoticed resulting in fatalities. HD Medical, Inc has designed an electronic stethoscope which is portable for screening children which helps detects these structural cardiac defects.

Aim:

To screen children between the ages of 0 days to 18 years for Congenital Heart Defects using HD Steth and comparing the results with Echocardiography results.



Study Design:

The study was performed in two parts – One part was screening children in the outpatient department of Sri Satya Sai Sanjeevani Hospital, Raipur and the second part was screening children in school in the Raipur district for congenital heart defects using HD Medical's screening device – HD Steth. The results obtained from the HD Steth device were compared with the results obtained from the Echocardiography machine, which is considered the standard procedure to detect structural heart defects.

Results:

A total of 1181 children were screened using the HD Steth device. The HD Steth identified 311 abnormal cases and 787 normal cases. The sensitivity for the study is 90.14% and the specificity for the study is 99%.

Total subjects screened:	1181
Total no. of subjects screened in OPD:	523
School Screening:	658
Total no. of True positives in OPD:	310
School Screening:	1
Total no. of True negatives in OPD:	130*
School Screening:	657
Total no. of False negatives in OPD:	81
School Screening:	0
Total no. of False positives in OPD:	2
School Screening:	0

Sensitivity	90.14%
Specificity	99%

Conclusion:

The study concluded a Sensitivity of 90.14% and Specificity of 99% for the HD Steth when compared to Echocardiography.

Study Limitation: Since close to half the samples were collected from patients visiting the outpatient department of the hospital, the bias that they are expected to have a cardiac condition exists.

Future Clinical Study Plan: To overcome this limitation, the next phase of this study will be conducted by screening children in the schools, comparing the results with Echocardiography.

References:

1. **Bhardwaj R, Rai SK, Yadav AK, et al.** Epidemiology of Congenital Heart Disease in India. Congenit Heart Dis. 2015; 10:437–446
2. **Katewa, A., Anand, K., & Sahu, B. (2018).** One-Stage Repair of Tetralogy of Fallot and Pseudoaneurysm of the Ascending Aorta After Central Shunt. World Journal for Pediatric and Congenital Heart Surgery. https://doi.org/10.1177/2150135117750566
3. **Anita Saxena.** Congenital Heart Disease in India: A Status Report. Indian J Pediatr 2005; 72 (7): 595-598
4. **Zheleva, Bistra et al.** The invisible child: childhood heart disease in global health. The Lancet, Volume 389, Issue 10064, 16 - 18

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*Specific Congenital Heart Defects like large **Atrial Septal Defect (ASD)** may not produce significant murmurs. They therefore are difficult to diagnose by the method of auscultation using a stethoscope alone. Other clinical evidence and Echocardiography may be required to confirm those conditions.

Cardiac Screening Program with HD Steth™

Congenital Heart Disease screening

- Chikkaballapur (Karnataka): 19,650
- Palwal (Haryana): 12,974
- Kharghar (Maharashtra): 8,020
- Raipur (Chhhattisgarh): 2,000
- Bastar (Chhhattisgarh): 5,563
- Kolkata(West Bengal): 8,450
- Trivandrum/Calicut (Kerala): 5,258
- Other Screening Centers: 40,085
- **Total Screening Count: 100,000+**