

THE PREVALENCE OF UNRECOGNIZED CONGENITAL HEART DISEASE AMONG THE ELEMENTARY SCHOOL STUDENTS IN NORTHERN THAILAND

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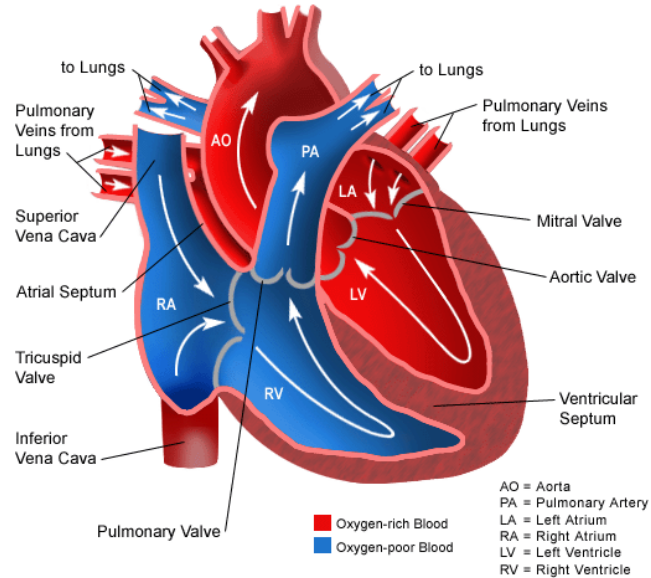
Introduction

- Congenital heart diseases (CHD) are the most common major birth defects.
- The worldwide prevalences ranging from 3.7 to 17.5 per 1000 live births
- In Thailand, the prevalences in Ayuthaya and Sukhothai provinces were 3 and 1.13 per 1,000 live births, respectively.

Mongkolsiri D, et al. The prevalence of congenital heart disease of elementary school aged students in Sukhothai province. Thai Med Counc Bull 34: 91-104.

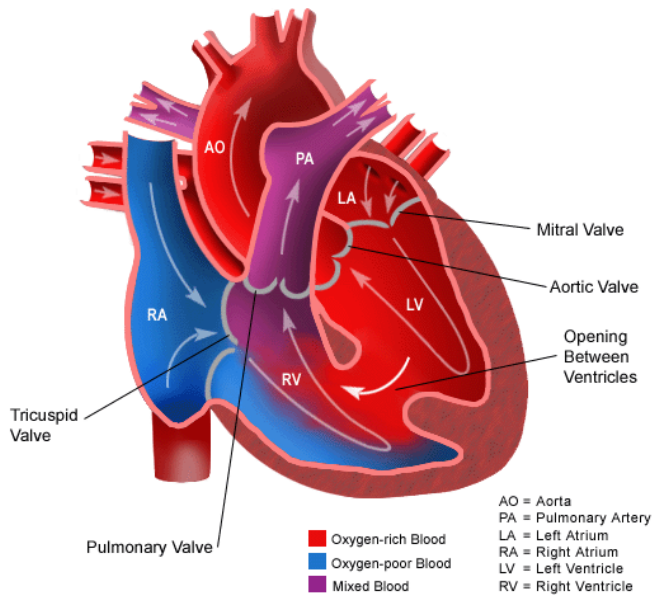
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Normal Heart



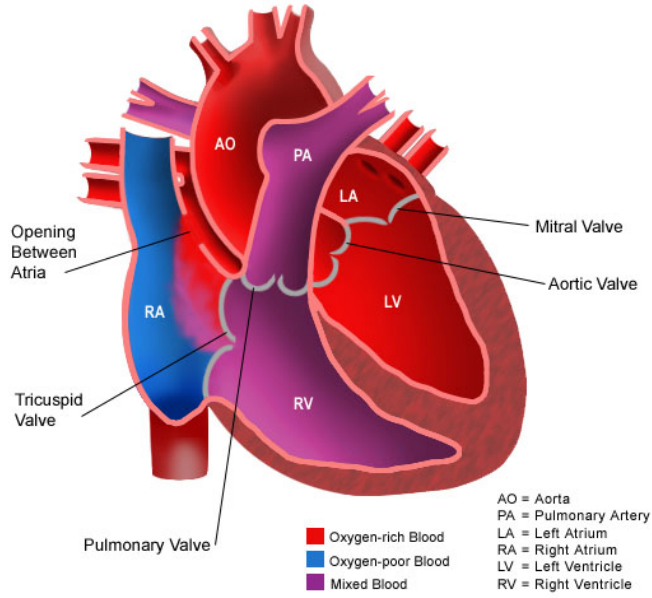
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Ventricular Septal Defect (VSD)



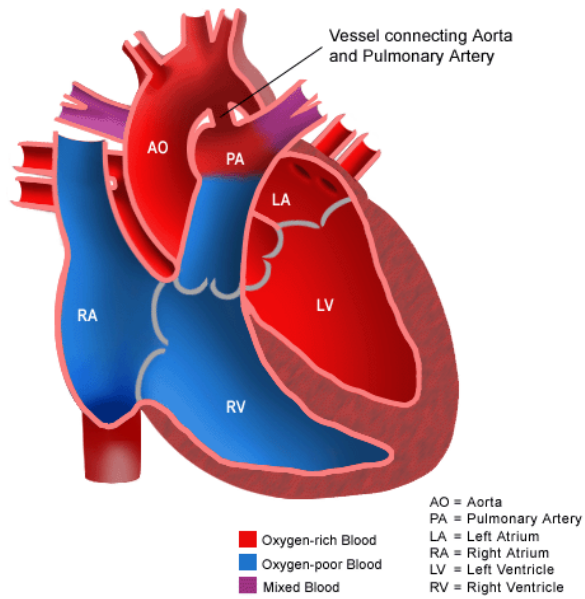
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Atrial Septal Defect (ASD)

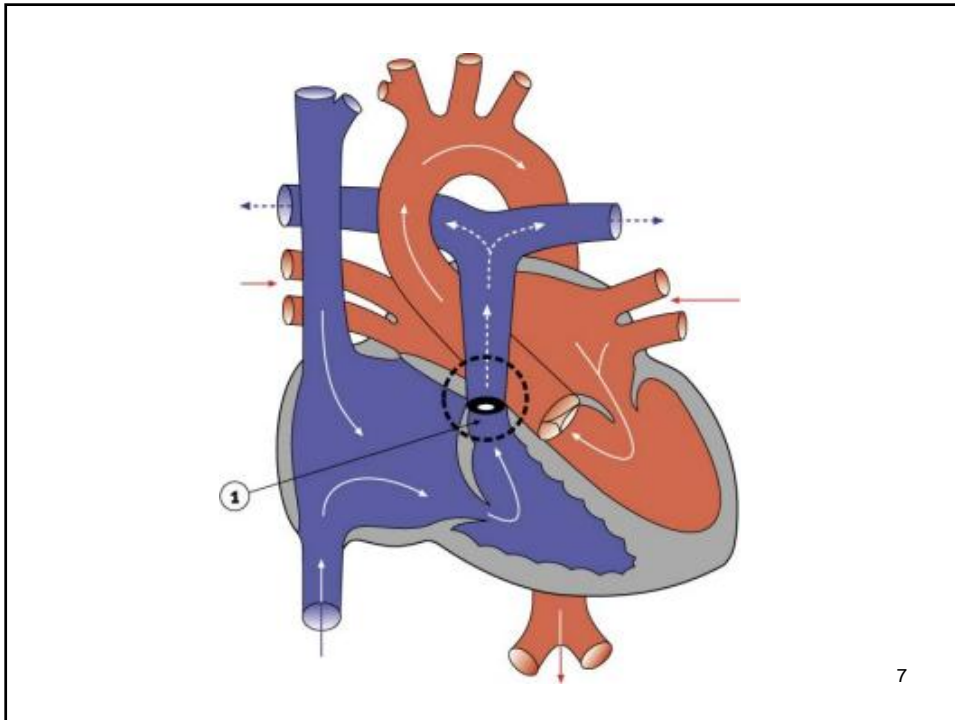


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Patent Ductus Arteriosus (PDA)



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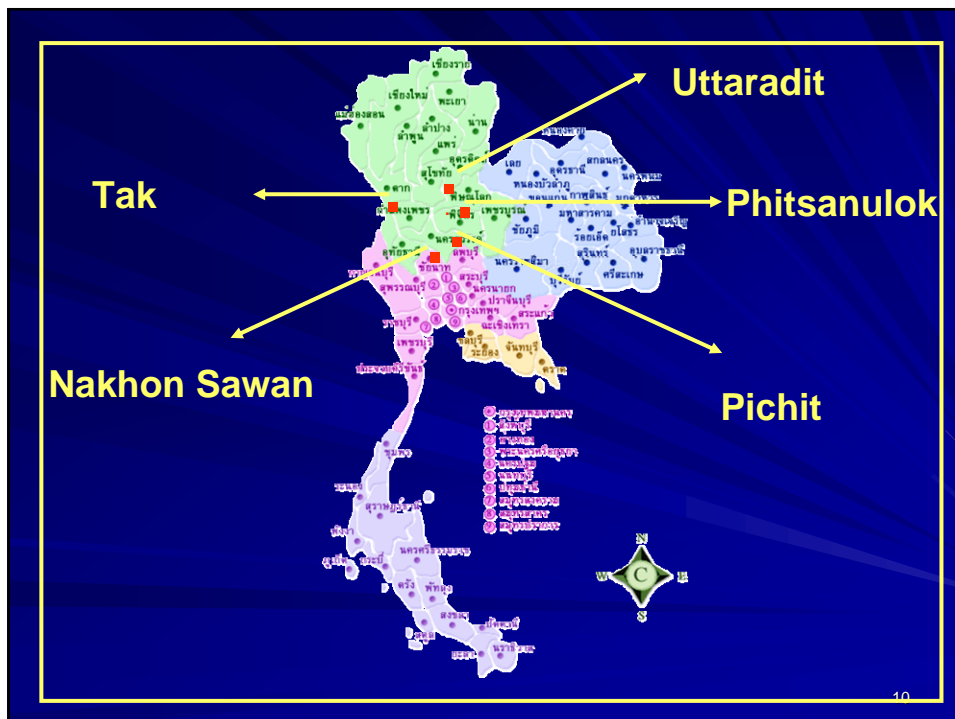
Introduction

- The morbidity and mortality rates increased in whom were delayed diagnosis and treatments.
- The purpose of this study was to survey the prevalence of unrecognized CHD among the elementary school students (aged 6-13 years old) in northern Thailand.

Materials and Methods

- From January, 2006 to September, 2009
- Cooperation with the provincial health offices for setting the training program.
- The nurses and health care workers were trained by pediatric cardiologists.
- To be a qualified personnel, the test scores after training had to be 75% or more.
- The students from all elementary schools from 5 provinces were included

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Inclusion of cases

All students in elementary schools from 5 provinces

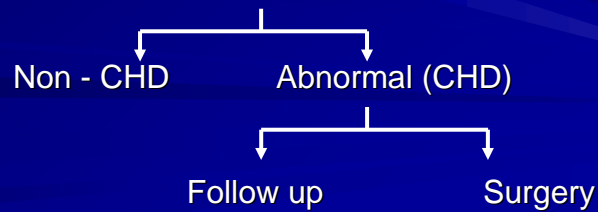
Exclusion for known cases of congenital heart diseases

Primary screening for CHD by qualified nurses and health care workers

The students with suspected abnormal heart conditions

Evaluation for CHD by pediatric cardiologists (electrocardiography, chest X-ray and echocardiography)

The students with confirmed abnormal heart conditions



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The suspected congenital heart disease students



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Confirmation of the suspected students



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Results

Province	Number of schools	Number of students	Students with positive screening	Students with confirmed CHD	Prevalence rate (per 1,000 students)
Tak	231	38,055	275	40	1.05
Nakhonsawan	591	79,319	494	36	0.45
Uttaradit	219	26,919	82	11	0.41
Phitsanulok	466	48,310	189	53	1.10
Pichit	391	39,474	102	27	0.68
Total	1,898	232,077	1,142	167	0.72

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Results

Type	Unrecognized congenital heart disease	
	Total cases (n=167)	percentage (%)
Ventricular septal defect	61	36.5%
Pulmonary stenosis	23	13.8%
Atrial septal defect	17	10.2%
Patent ductus arteriosus	13	7.8%
Others (AS, AR, MVP ...)	53	
	31.7%	

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Discussion

- The average prevalence of this study (0.72 per 1,000 students) is similar to the studies in India and Egypt but lower than in Sudan.
- The variation of prevalences may be from different methodologies, genetics and environmental factors

Bassili A, et al. Congenital heart disease among School children in Alexandria, Egypt: an overview on prevalence and relative frequencies. *J Trop Pediatr* 46: 357-362.
Kapoor R, et al. Prevalence of congenital heart disease, Kanpur, India. *Indian Pediatr* 45: 309-311.
Khalil SI, et al. Prevalence of congenital heart disease among schoolchildren of Sahafa town, Sudan. *Sudan Med J* 3: 24-28.

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Prevalence of CHD worldwide

study	Diagnostic tool	Age	Prevalence / 1,000
North America			
New England Regional Infant cardiac program USA 1969-1977	Invasive	One year	2.2
Baltimore Washington Infant study USA 1981-1982	Invasive Non-invasive	One year	2.4 3.7
Alberta Heritage pediatric cardiology program Canada 1981-1984	Invasive Non-invasive	One year	3.4 5.4
Europe			
Italy 1975-1984	Non-invasive	At birth	123
Bohemia 1977-1984	Invasive	At birth	5.2-9.6
Africa			
Alexandria, Egypt 1995-1996	Non-invasive	School age	1.01
Menoufeya, Egypt, 1994	Clinical	School age	2.4
Sudan, 1997	Non-invasive	School age	2
Asia			
India, 1992	Non-invasive	School age	0.7
Central Australia 1993-2000	Non-invasive	At birth	17.5

Non-invasive; by echocardiography; invasive, by catheterization or autopsy

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The common congenital heart disease

Order	Queen Sirikit National Institute of Child Health, Thailand	India, 2002-2007 school age	Egypt, 1995-1996 school age	Bosnia, 1995 at birth	Sudan, 1986-1990 school age
1	VSD	VSD	VSD	VSD	VSD
2	PDA	ASD	PS	ASD	ASD
3	ASD	PDA	ASD	AVSD	TOF
4	PS		MVP	PDA, PS	PDA

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Discussion

- Pulmonary stenosis ranks the second common type that similar to the study performed in Egypt.
- The reasons of pulmonary stenosis rank second in **unrecognized** CHD were
 1. Patients with left to right shunt lesions (ASD, PDA) had been early diagnosed and corrected before school age.
 2. Most children with asymptomatic pulmonary stenosis are delayed diagnosis due to inadequate evaluation.

Bassil A, et al. Congenital heart disease among School children in Alexandria, Egypt: an overview on prevalence and relative frequencies. J Trop Pediatr 46: 357-362

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Conclusions

- The average prevalence of unrecognized CHD was 0.72 per 1,000 students.
- This study indicates that the delayed proper management for CHD which can cause deleterious effects.
- The ventricular septal defect, pulmonary stenosis and atrial septal defect were common **unrecognized** CHD in this study (36.5%, 13.8% and 10.2%, respectively).

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Conclusions

- The qualified nurses and health care workers can be helpful for detecting unrecognized CHD patients.
- The screening model by training paramedics can be developed as the national heart screening program in all provinces of Thailand.

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Acknowledgements



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Thank you for
your attention

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Criteria for suspected abnormal congenital heart diseases

- Failure to thrive
- Dyspnea, tachypnea
- Cyanosis
- Recurrent respiratory tract infection
- Syncope
- Chest pain
- Syndromic appearance

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