

Study on the cardiac causes for chest pains nursing essay



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The relation of chest pains with cardiac causes responsible for the pain was one targeted area for studies. From the previous researches chest pain was observed to be one common complaints in children and previous findings reported it to be more prominent in old ages with mean age of 13 and cardiac causes was responsible for less than 20% of chest pain complaints in younger children and in community which was supposed to exist because of ischemic vertical dysfunction, myocardial and pericardial inflammatory process or arrhythmia but exact cause for cardiac chest pain was still in dark. Specialised methods like echocardiography, Holter monitoring, exercise stress test, electrophysiological studies were reported to be required to assess cardiac diseases in children responsible for chest pain but still it may not be able to give exact causes of chest pain. The purpose for this study was to identify cardiac diseases and to explore cardiac causes which were directly associated with chest pain in children.(Cagdas and Pac, 2009)

Methods:

In this study 120 children with ages in between 5-16 years who were frequently reported to pediatric cardiology clinic regarding chest pain were analysed in a tertiary subspecialty clinic from March 2005 to May 2006. The reason for selecting children with ages 5-16 years having chest pain complains was based on previous findings of studies and was good choice of selection for assessment of cardiac diseases related to chest pain as it was targeted group for chest pain and further in this study it was divided in two age groups that was 5-12 years age group and 13-16 years age group because of psychogenic pain consideration in children older than 12 years

age which was good reasoning for dividing groups. Thus it was cross-sectional and a retrospective assessment but as it relies on previous findings and data from other clinics it might have limitations in selection and number selected that was 120 subjects seems to be very less for this type of assessment thus it might lead in error.(Cagdas and Pac, 2009)

The strength of this study was dependent on the outcomes of methods used for analysis of cardiac diseases associated with chest pain. All selected patients were subjected to Echocardiography, Electrocardiography(ECG) and Chest X-Ray and analysis of Hemogram, serum glucose and electrolytes was done. In Chest X-Ray all necessary images to diagnose heart, lung, chest wall and big vessels are generated by ionising radiation in X-ray form (P. A. Mahesh, 2006). In Electrocardiography functioning of different parts of heart muscles are measured by recording in skin electrodes placed on different positions of heart and it displays in ECG as electrical signal. The display of ECG shows rhythm of heart and damage of any heart muscles can be concluded(Meek and Morris, 2002). Echocardiogram generates two-dimensional pictures using ultrasound techniques for cardiovascular systems. In Echocardiography echoes of sound waves are picked by transducer and are transmitted as electrical impulses which are then converted to motion pictures of heart by Echocardiography machine and also movement of blood via heart is recorded by Doppler probe. Different types of cardiac diseases can be identified by this methods.(Quinones et al., 2003)

Also exercise and tilt table test and twenty four hour Holter monitoring was carried out in some required cases which also gave detail regarding cardiac diseases. In 24 hour Holter monitoring test for 24 hour an electrodes are
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attached on chest of the subject to be monitored by which electrical activity of heart is recorded to an attached small battery operated monitor. Note of all activities carried out by patient during 24 hours is required and results after 24 hour of test are analysed to see any irregular changes in rhythm of heart and for further analyses of cardiac disease (Hilbel et al., 2008).

Different ways are developed to perform tilt table depending on individual patient generally patient is obstructed to any physical movement of body and kept flat on tilt table and it is then suspended or tilted at different angles. Records of symptoms, blood pressure, pulse, electrocardiogram etc are kept during test which can be use for analysis of cardiac disease(Benditt et al., 1996).

Actually this study was designed and conducted on algorithm setup in which depending on types of symptoms observed from physical examination and history of patients it was further evaluated using different methods to identify cardiac causes.(Cagdas and Pac, 2009)

SPSS 11. 0(SPSS, Inc., Chicago, IL, USA) software was use to carry out statistical assessment in which Chi-square test was selected for analyses of difference in variables of groups in which significant level p value was kept less than 0. 05 and risk between groups was compared by odds ratio value(95% Confidence Interval). Here the total number of patients was 120 which is quite large thus selection of Chi-square test to analyse difference in variables of two groups was perfect.(Cagdas and Pac, 2009)

Results:

In this study out of 120 patients depending on history and physical examination evaluation of further detail assessment by performing stated techniques as required 52(42. 5%) patients were found to have cardiac diseases out of which 11(9. 2%) patients on admission were found to have history of cardiac disease and in 28(23. 3%) patients chest pain was supposed to be directly associated with cardiac disease and out of 28 patients 14(11. 6%) were reported with different types of arrhythmias as shown in table 2.(Cagdas and Pac, 2009)

On complete assessment of all patients for cardiac disease according to the age group that is 5-12 years of age and 12-16 years of age the children were analysed with structural Cardiac Disease and types of arrhythmia as shown in table 1 and 2.(Cagdas and Pac, 2009)

Different types of Cardiac diseases found to be associated with chest pain is also listed in table 1 and 2. In table 2 patients with infrequent supraventricular ectopy and ventricular ectopy were excluded.(Cagdas and Pac, 2009)

Table. 1. SPSS result for frequency and risk of structural cardiac disease according with age in patients with chest pain(Cagdas and Pac, 2009)

Groups

Structural Cardiac Disease

pI±

Present

Absent

Type

N

Total, n(%)

Total, n(%)

5-12 years old (n= 55)

RVHD

5

11(20)

44(80)

0. 011

MVP

3

CMP

1

ASD

1

PFO

1

13-16 years old (n= 65)

RVHD

12

27(41. 5)

38(58. 5)

MVP

4

CMP

3

VSD

3

AS

3

ASD

1

PFO

1

±Chi-square test, Risk analysis, Reference group is taken as 5-12 years age group

AS- valvular aortic stenosis, ASD- atrial septel defect, CMP- cardiomyopathy, MVP- mitral valve prolapse, PFO- patent foramen ovale, RVHD- rheumatic valvular heart disease, VSD- ventricular septal defect

Ref: CAGDAS, D. N. & PAC, F. A. (2009) Cardiac chest pain in children.

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As shown in above SPSS result the risk of structural cardiac disease in elder age group was 2.84 times higher as compared to younger age group and significant p value was 0.011 which was less than 0.05 which states that there was significant difference between variables of two age groups with structural cardiac disease.(Cagdas and Pac, 2009)

Table. 2. SPSS result for Frequency and risk of arrhythmia with age in patients with chest pain(Cagdas and Pac, 2009)

Groups

Arrhythmias

$P\hat{I}\pm$

Present

Absent

Type

N

Total, n(%)

Total, n(%)

5-12 years old (n= 55)

Frequent VE and SVE

3

3 (5. 5)

52 (94. 5)

0. 05

13-16 years old (n= 65)

Frequent VE and SVE

7

11 (16. 9)

54 (83. 1)

WPW Syndrome

2

Sinus bradycardia

1

Sinus pause

1

±Chi-square test, ²Risk analysis, Reference group is taken as 5-12 age group

SVE - supraventricular ectopy, VE - ventricular ectopy, WPW - Wolff-Parkinson-White syndrome

Ref: CAGDAS, D. N. & PAC, F. A. (2009) Cardiac chest pain in children. Anadolu Kardiyoloji Dergisi-the Anatolian Journal of Cardiology, 9, 401-406.

As shown in above SPSS result the risk of arrhythmias in elder age group was 3. 53 times higher as compared to younger age group and significant p value was 0. 05 which shows borderline significant difference in variables of two groups with arrhythmias.(Cagdas and Pac, 2009)

Overall analysis of arrhythmias and structural cardiac disease reported 4. 12 times higher risk of cardiac disease in elder age group (12-13 years age) as

compared to that with younger age group (5-12 years age).(Cagdas and Pac, 2009)

Discussion:

The results of this study was compared with other studies and different required methods were performed for analyses of cardiac disease related to chest pain which was not performed in previous studies. In previous findings majority of patients were assessed by only echocardiography without performing 24 hour holter monitor test to any patients while in this study echocardiography was performed to all children and holter monitoring was done for 38(31. 6%) patients out of 120 as required and also frequencies of arrhythmias was found to be 11. 6% and same ratio for structural cardiac disease which as compared to other studies was high. Thus use of various methods for assessing cardiac diseases associated with chest pain was good effort made in this study.(Cagdas and Pac, 2009)

One finding of this study was that chest pain complains was more in the elder children which was supported by previous epidemiological studies for the chest pain complaints. Cardiorespiratory problems in young children and psychogenic pain in children older than 12 years of age was reported from previous studies while from this study 4. 12 times more risk to cardiac disease was found in elder age group on analysing all cardiac diseases and was explained because of aging related risk of arrhythmias or increase in structural cardiac diseases symptoms or increase in level of consciousness with increasing age regarding cardiac chest pain symptoms which was satisfactory reasoning given in this study. From the SPSS results it concluded that older children were at high risk to structural cardiac disease ($p= 0. 011$)
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and 3. 53 times more frequent to arrhythmias. Thus use of SPSS results in analyses of cardiac disease was one very important part of this study as it explored some critical and different results compared to other studies.

(Cagdas and Pac, 2009)

In 28(23. 3%) patients chest pain was supposed to be directly caused by cardiac diseases and which was assumed because of high frequency of some cardiac diseases in patients selected but clear reasons for chest pain was still not proved. From previous studies majority of non-cardiac chest pain was reported because of gastro-esophageal reflux diseases and in this study total 40 patients were suffering chest pain because of similar reasons like abdominal pain, epigastric tenderness etc which highlighted one important conclusion that their may exist more than one cause for chest pain not necessary that its always related to cardiac disease. This study also gave example of important application of echocardiography in diagnosis of rheumatic valvular heart disease as it was detected in 17 children as compared to analyses done by clinical examination for existence of rheumatic valvular heart disease.(Cagdas and Pac, 2009)

In this study following the particular algorithm the study groups were analysed from which many results reported was different from that concluded by physical examination like in 16 patients physical examination showed it to be innocent murmur but was found to have structural cardiac disease on further analyses. Thus though this type of algorithm requires some extra excercise but it made analyses to identify cardiac disease more clear.(Cagdas and Pac, 2009)

Overall this study concluded that risk of cardiac disease was increased with age and it also gave percentage of cardiac disease that was 42.5% which was high as compared to other studies. The study also highlighted importance and use of different methods that can be used for detail analyses of cardiac disease that was not covered in previously performed studies but this type of evaluation was to be carried out with larger number of patients to get more clear with results and draw important conclusion because by analysing only 120 children with chest pain one common conclusion can not be given. Selection of proper SPSS tests was done which gave important results for this study. This study attempted very well to identify cardiac diseases causing chest pain with all good planning and reasoning behind all steps and methods used but still research in area of cardiac diseases will not be clear unless any sure and specific result for particular cardiac disease can be taken as reference to identify and to draw conclusion.