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Research Article

**FREQUENCY OF CHYLOTHORAX IN CHILDREN DURING  
OPEN HEART SURGERY**<sup>1</sup>Dr. Muhammad Huzaifa, <sup>2</sup>Dr. Javaria Siddiq, <sup>2</sup>Dr. Ahmad Raza<sup>1</sup>Nishtar Medical College Multan, Pakistan<sup>2</sup>Mayo Hospital Lahore**Abstract:**

**Background:** There was no definite plan to handle the after-operation production of the pleural effusion in which chyle accumulating in the pleural cavity and obstructs the thoracic duct. The handling of obstruction in thorax produced by chyle after cardiothoracic surgery would be reviewed.

**Methods:** There were 51 patients with a medium age of eleven months. The range of the age was 04 days to 19 years. All these cases were from 1991 to 2017. The sufferers' reactions on different tests were recorded.

**Results:** The occurrence of the after surgery chylothorax was 0.85 percent. It means fifty-one out of five thousand nine hundred and ninety-five. Its development range was zero to twenty-eight days. It caused the demise of 04 patients and other forty-seven had the chyle drain value of one hundred fifty-six millilitres per kilogram and median period was zero to eighty-nine days.

**Conclusions:** The admission days of the children in the hospital were increased by the obstruction produced by chyle in the thoracic duct. The duration of obstruction produced by chyle in the thoracic duct can be made short by early discovery of the disease. Sufferers with the extreme condition were handled by surgeons.

**Key Words:** Cardiothoracic, Surgery, Chyle, Coronary diseases

**Corresponding Author:**

**Dr. Muhammad Huzaifa,**  
Nishtar Medical College,  
Multan, Pakistan

QR code



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**INTRODUCTION:**

Early diagnose and early treatments for the patients of coronary heart diseases have increased the percentage of survival. The after-operation condition of these patients becomes more difficult when unhealthy condition continues to proceed. The chyle accumulating in the pleural cavity due to the obstruction in thoracic duct is one of the beginnings after operation difficulty. After cardiothoracic surgery leakage of the chyle is due to the surgical distortion in the thorax and it increases the pressure in the thoracic duct. The chyle remains unidentified for a long period of time and causes the loss of body nourishment. It also affects the immunity system of our body [1].

Modern investigations in this topic revealed an increase from two-point five percent to four-point seven percent in after surgery accumulation of chyle in the pleural cavity and obstructs the thoracic duct. It occurs because it is serious nature of surgery and early feeding to the patients enhances the complications. Death can occur due to the extreme loss of the digestive fluid known as chyle. It was very hard to pin down the method to manage the after operation chylothorax. The use of normal triglycerides or nourishment is one of the methods to manage this problem. In these modern days' different type of advance strategies is being used to overcome this problem as MCT, rich food, TPN and close central veins process of restoring flow [2]. This current research gave us the information about the chyle accumulation in the pleural cavity causing the obstruction in the thoracic cavity after cardiothoracic surgery in 51 patients.

**METHODS:**

51 patients of coronary heart diseases who got pleural effusion of chyle in the thorax after cardiothoracic operation were searched out from the hospital record from 1991 to 2017. All the data related to those patients was checked including their social status, diagnose of their heart problem, duration in the hospital, total amount of chyle taken from them on daily basis, serum level in their blood, type of operation used for them during surgery and outcomes after operation. To check the rate of this disease in same period of that time all the recorded data of operations for the particular period of time was taken from the hospital record office. The consent of the research was taken from the patients after the authorization granted by Institution.

**Institutional Management Strategy**

Use of the nourishment aids to the patients was a traditional management strategy before two thousand. The octreotide treatment was used to check the chyle leakage which is a potent inhibitor

of the growth hormone, glucagon and insulin than the natural hormone. It was also used to reduce the portal hypertension. Octreotide different amount was being used as compared to the chyle leakage. The side effects of using this therapy were also monitored.

**RESULTS:**

There were five thousand nine hundred and ninety-five heart patients. Fifty-one patients from four days to 19.6 years were selected from them. Twenty-six were male patients in them. These fifty-one went under surgery over thirty-three-year period. They were point eighty-five percent of the total. Thirty-one out of one thousand three hundred and sixty-four were identified with chylothorax from 2000 to 2017. It was point forty-five percent increase from the previous twenty years. There were twenty-one patients out of four thousand and thirty-one from 1991 to 1999. Four patients died between twenty-four to one hundred and three days after surgery. Forty-seven survivors stayed at hospital from thirteen to one hundred thirty-five with an average of 32 days. The obstruction in the right ventricular was the common heart complication. The rectification of the right ventricular output was the most common type of surgery.

**Chylothorax**

It is a pleural effusion in which lymph formed in the digestive system known as chyle accumulating in the pleural cavity and obstruct the thoracic duct. Chylothorax took about average nine days for its complete development. In sixteen patients, it was on left side [3]. In seventeen patients, it formed on right side and it was on both sides in eighteen patients. Medium chyle drainage period was about fifteen days in patients. The drainage period and amount of chyle in the four patients who faced the death was higher than remaining patients.

**Evolution of Management Strategy**

Our department got the facility of octreotide in 2000. 21 patients were present in the history record before that period when octreotide was not available. All twenty patients got their feeding through parents except one who received diet of triglyceride. Operation of 2 patients was required for the complete stoppage of leak of chyle. It took a lot of days in both patients for the complete termination of the chyle leak. One of the patients died due to failure of the heart [4].

From 2000 to 2017, 31 sufferers of chylothorax were discovered. In twelve patients, chylothorax was mitigated in an average of 10 days. Hypertensive crisis caused the death of one patient after the rectification of drainage in the veins. 4 patients were in critical condition and they were required heart surgeries. The one patient got injury

in lymph system during surgery so he had to go under joining of thoracic duct. Octreotide cure was applied for almost seventeen days due to the constant leak of the chyle. With the help of the insertion of the shunt the second patient got rid of chyle accumulating in the pleural cavity [5]. All other patients died after three months of operation due to the continuous leak of chyle in the pleural cavity which was uncontrollable after the surgical interference. Octreotide treatment was provided to eighteen patients; it was initiated after an average of nineteen point five days after the start of the chyle leak. About 83% mean fifteen out of eighteen patients got rid of chyle leak and no side effects developed from therapy carried out by octreotide.

The chylothorax which was in need of octreotide therapy was too much dangerous than the others because chyle leak in them was in greater volume and for longer period of time with the occurrence of septicaemia. The start of the therapy after leak of chyle, admission stays of hospital and mortality rates were same as compared to the patients of first twenty years [6].

Octreotide treatment was provided to eighteen sufferers and the surgical interference was the requisition of four patients. After only six day of treatment, there was a decrease in the average output of normal routine. The decrease was about fifty percent.

<b>TABLE-I: CARDIAC DIAGNOSES AND OPERATIONS OF THE 51 PATIENTS</b>			
<b>Cardiac Diagnoses</b>	<b>No.</b>	<b>Cardiac Operations</b>	<b>No.</b>
Left-to-right shunts		Repair of left-to-right shunts (VSD, AVSD, ASD, PDA)	10
VSD	3		
VSD + PDA	1		
AVSD + PDA	2		
VSD + ASD + PDA	1		
ASD	1		
PDA	2		
Aortic lesions		Aortic reparative surgery	4
Coarc of the aorta	3		
Double aortic arch	1		
RVOT obstructive lesions			
PAVSD	8	Systemic-to-pulmonary arterial shunt insertion	13
PAIVS	3		
TOF	9	Right ventricular outflow reconstructive surgery	16
Isolated PS	2		
PS with L=>R shunts	2		
Univentricular hearts	9	Fontan-type operation	4
TGA with VSD venous	3	Miscellaneous procedures (arterial switch operation, pulmonary repair)	4

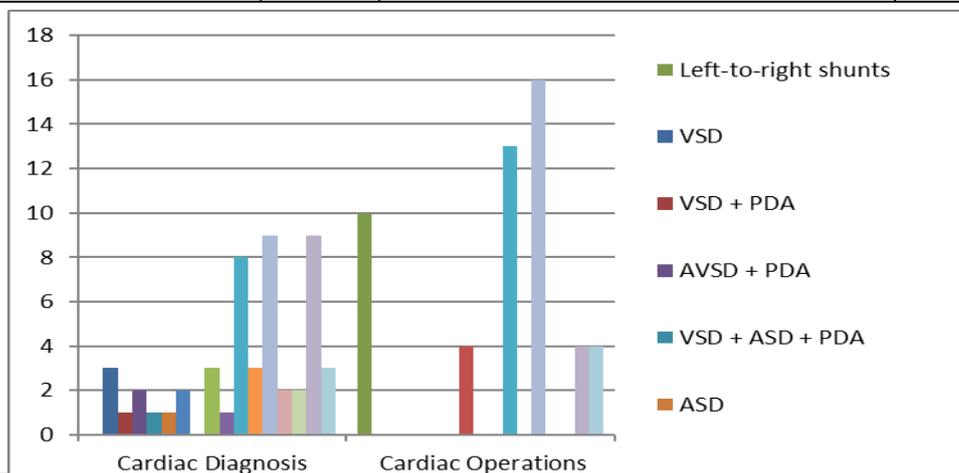
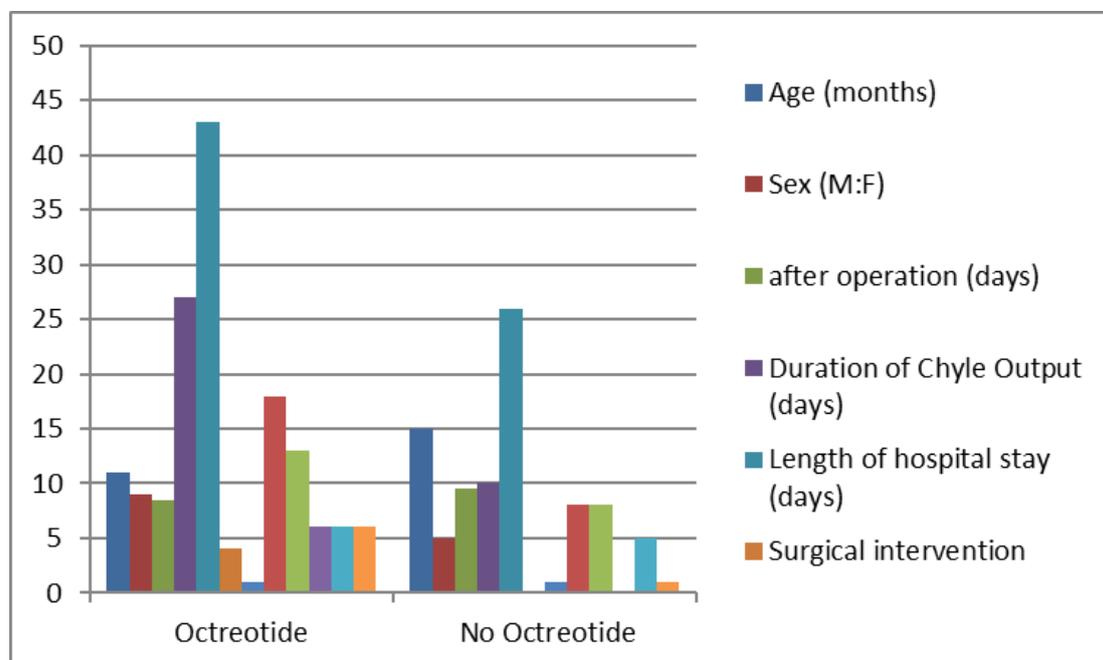


TABLE-II: COMPARISON OF DEMOGRAPHIC AND CLINICAL VARIABLES AMONG DIFFERENT PATIENT COHORTS			
Variables	1981-1999		2000-2013
	(n = 21)	Octreotide (n = 18)	No Octreotide(n=12)
Age (months)	6 (0-235)	11 (0.5-60)	15(0.25-79)
Sex (M:F)	12:09	9:09	5:07
Onset of chylothorax			
after operation (days)	10(0-35)	8.5(1-15)	9.5(4-18)
Duration of chyle output (days) 12(1-131)		27 (11-89)	10(3-16)
Duration of chyle output			
after starting octreotide therapy			
(days)	—	14.5 (7-30)	—
Total volume of chyle (mL/kg)	150(4-1334)	388(91-6476)	78(3-179)
Length of hospital stay (days)	36 (17-135)	43(15-103)	26 (13-32)
Surgical intervention	2 (9.5%)	4 (22%)	0(0%)
Mortality	2 (9.5%)	1 (5.5%)	1 (8%)
Morbidity			
Hypoalbuminemia	12(57%)	18(100%)	8 (67%)
Lymphopenia	10(48%)	13(72%)	8 (67%)
Septicemia	1 (5%)	6 (33%)	0(0%)
Pneumonia	13(62%)	6 (33%)	5 (42%)
Acute renal failure	5 (24%)	6 (33%)	1 (8%)



### DISCUSSION:

During the past few decades, there was an eminent increase in the occurrences of chylothorax in past thirty years and it is confirmed through previous investigations. The increase in the patients in recent years is caused by the early feeding to the patient

and the complex nature of surgery involved. The death rate of our patients was six to twenty-one percent [7]. The accumulation of the chyle in the thoracic cavity may start in all types of heart operations. The use of the complicated surgical technologies in the functioning of the heart is a

cause of chylothorax. The leakage of the chyle duration is longer after application of Fontan procedures. This discovery also confirms the outcomes of Chan and his partners [8]. We find the closed coronaries surgeries in both past and present eras. During the heart transplantation process, a large amount of chyle leakage has been observed. High amount of chyle loss in the thorax is caused by tension. The chyle loss remains constant in all the patients from past to present [9].

The use of chest tube for drainage of the chyle is one of the best management for the children after cardio thorax surgery. Triglyceride aid for a period of fort five days has given the chyle loss rectification about seventy-seven percent. The conventional administration can be fail by the high vein pressure and the chyle drainage for more than twenty-one days [10]. These two are the high-risk traits for the conventional management. About ninety percent patients from nineteen eighty-one to nineteen ninety-nine gained lives by the conventional management. The period of the conventional administration varies among different institution and operation is authorized if chyle leak is more than one to four weeks. The surgical treatments are not always successful [11].

The use octreotide in our department gave a complete change in administration police to handle chyle leak since two thousand. Before surgical interference, it was necessary to handle the problem with the use of octreotide. Lymph output is reduced by the use of octreotide. The side effects of the octreotide in the children are rare and they are not of dangerous nature. It was astonishing that no patient of our institution got any side effect due to octreotide treatment. There is some side effect related to intestinal by octreotide are well recorded [12].

It is very difficult to escape from limitations of the current study because it has backward looking nature. There is a difference in the complexities faced by these patients before disease i.e. before operation preparation, difficulty in operation and severity of the pleural effusion of the chyle [13]. In this research it is clear that there is no difference in the death rate and admission tenure of these patients and the patients of the past. It is very difficult to find the reaction failure to sandostatin in these small numbers of patients.

### CONCLUSION:

There is a little complication in rise of effusion of chyle in the thorax after the rectification of the heart diseases but it is an important cause of death. It is compulsory to maintain the fluids and nutrition aids in the children and infants while mitigate the chyle leakage by the use of therapies. It is very hard to pin down at this stage about any appropriate

method for the treatment of after operation chylotorax. Different types of therapies and methods are being used to counter this fatal disorder. Early diagnose and better treatment can handle the situation very effectively and prevent us from harmful consequences.

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