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Research Article

**A CROSS SECTIONAL STUDY ON OCCURRENCE RATE OF
ETIOLOGICAL REASONS CAUSING PDA (PATENT DUCTUS
ARTERIOSUS)**¹Dr. Hafsa Naseer, ²Dr.Sadia Shafique, ³Dr. M. Omer Rehman Rana¹Madina Teaching Hospital, ²Abbas Institute of Medical Sciences, ³Madina Teaching Hospital**Abstract**

Objective: Carried out the current research study to find the occurrence rate of factors causing PDA (patent ductus arteriosus) in infants.

Study design, Duration and Place: Conducted this cross-sectional study for the duration of one year starting from May 2017 and ended in April 2018 at the venue of department of cardiology Services Hospital, Lahore.

Methodology: Carried out present research study on children suffering from Patent Ductus Arteriosus (PDA) which were 242 in total quantity and also got medical treatment before undergoing this study. Cross examined them on their regular base checkups and visits. Collected the information about their previous medical treatments and history data through their clinical chart sheets.

Results: From selected 242 children percentage of females was high than the male children as 62.80 % and 37.20 % respectively. The average age of patients during the medical treatment was 06.12 ± 05.20 Years. During pregnancy mothers of 43.40 % (105) children were having infectious diseases and 17.80 % patients got sickness from their blood relations. Use of drugs or antibiotics during pregnancy observed in mothers of 42.60 % (103) children. Down syndrome was there in 4.5 % (11) patients. Premature birth happened in 56.62 % (137) cases.

Conclusion: Etiological factors for development of PDA observed during present study as premature birth, use of drugs and smoking habits of mothers, light weight on birth and infections during pregnancy.

Key Words: Catheter-based procedure, Surgical Ligation, Patent Ductus Arteriosus, Etiological factors.

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INTRODUCTION:

Emerging as main problem in Pakistan is PDA (Patent Ductus Arteriosus). Several research studies in Pakistan carried out to examine the effectiveness of surgical procedures but none attempted to discover the occurrence of reasons causing this disease. In PDA just after the birth of child, blood vessel known as ductus arteriosus fails to close naturally [1]. There is a very less information available on the normal history of untreated patent ductus arteriosus, but problems can produce [1]. Amongst descending aorta and left pulmonary artery constancy of a normal structure is Patent Ductus Arteriosus (PDA). This structure persistence will be called as abnormal when it will be there after ten days. Patent Ductus Arteriosus (PDA) is variable in its nature. Some times it might be changing from small to big in its size and sometime during physical examination it might not be detected. Without treatment, spontaneous ductal closure can happen. Complications may comprise of the development of pulmonary vascular disease, congestive heart failure (CHF), bacterial endocarditis and growth failure. It can perplex further cardiorespiratory situations [2]. In US, PDA is a usual genetic heart defect. This condition very frequently happens in preterm borne babies at a frequency of approximately 08 out of every one thousand births. Nevertheless, at a frequency rate of two from one thousand, it also happens in normal borne babies [2]. Occurrence of PDA found was in 9.70 % cases as per the results of a research study carried out in KPK in the year 2002 [3]. Soon after in 2006 the occurrence of PDA raised to 12.80 % according to the findings of a study conducted in Peshawar, KPK [4]. That is the reason,

the current study carried out to get knowledge of causes and reasons resulting in PDA.

METHODOLOGY:

Held current study on children under going from Patent Ductus Arteriosus (PDA). Patients were 242 in total quantity. Cross examined them on their repeated checkups and visits. Interviewed parents of children for certain information. Collected the information about their previous medical treatments, history data, age at time of presentation, size of PDA and procedure through their clinical chart sheets. Quantitative variables like height of the children, size of PDA, mother's age and child's age measured as average plus/minus standard deviation. Qualitative variables like any infection to mother during labor of the affected infant, smoking habits of parents, inheritance, Down syndrome, area of residency and gender measured as percentage and frequency. After having the informed written permission from parents gathered concerned data. Present study pattern was observational that is why no ethical issues were there.

RESULTS:

From selected children total in quantity (242) percentage of female was higher than the male children as 62.80 % (152) and 37.20 % (90) respectively. With minimum and maximum age as one year to 16 years respectively, the average age of patients during the medical treatment was 6.12 ± 05.202 Years whereas, the mean current age was 7.442 ± 5.312 Years. Made 04 age groups as 01 year to 04 years, 05 years to 08 years, 09 years to 12 years and 13 years to 16 years at the equal intervals of 04 years and the percentage of children were as 52.10 %, 21.50 %, 7.0 % and 19.40 % respectively.



Table No 01: Age Group Distribution of children

Age Group (Years)	Percentage (%)
01 - 04	52.10
05 - 08	21.50
09 - 12	7.0
13 - 16	19.40

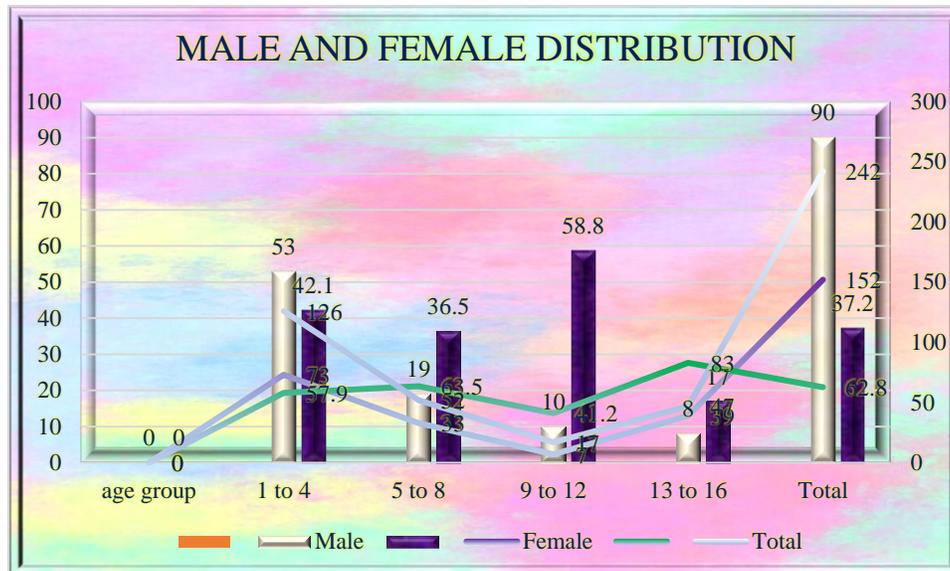


Percentage of urban and rural areas was as 72.70 % and 27.30 % respectively clearly showing the strength in number of urban areas. Mean weight and height of the patients at the time of treatment was as 24.9 ± 11.330 kilo gram and 3.510 ± 1.182 feet accordingly. With minimum and maximum age of mothers as 19 years and 40 years respectively, the mean current age and at the time of birth was as 34.64 ± 07.48 years and 27.17 ± 04.42 years accordingly. While, at the time of treatment the mean size of PDA was 06.87 ± 03.58 milli meter. Inherited children of the disease from their blood relations like sister, brother, mother, father, grand mother and grand father were 17.80 %. Down's syndrome was

found in only 4.50 % children whereas, percentage of premature birth was as 56.60 %. During pregnancy rubella and other serious infections informed by 43.40 % of women and amongst these pregnant women 42.60 % took antibiotics for treatment during pregnancy. According to observations 66.10 % patients were medically treated for curing of PDA but adopted surgical intervention when the aperture was not closed. According to the conditions of children carried out surgical ligation and catheter-based procedure on 54.50 % and 45.50 % patients respectively. Direct smokers as mother and indirect smokers as father also observed in 63.60 % cases.

Table No 02: Age wise male and female distribution

Gender		Age Group				Totalize
		01 - 04	05 - 08	09 - 12	13 - 16	
Male	Frequency (N)	53	19	10	08	90
	Percentage (%)	42.10	36.50	58.80	17.0	37.20
Female	Frequency (N)	73	33	07	39	152
	Percentage (%)	57.90	63.50	41.20	83.0	62.80
Totality		126	52	17	47	242



DISCUSSION:

Percentage of female was higher than the male children as 62.80 % (152) and 37.20 % (90) respectively out of examined 242 children. With minimum and maximum age as one year to 16 years respectively, the average age of patients during the medical treatment was 6.12 ± 05.202 Years whereas, the mean current age was 7.442 ± 5.312 Years. Made 04 age groups as 01 year to 04 years, 05 years to 08 years, 09 years to 12 years and 13 years to 16 years at the equal intervals of 04 years and the percentage of children were as 52.10 %, 21.50 %, 7.0 % and 19.40 % respectively. Observed development of PDA two to three times more in females than the males. Compared to male found PDA more common in females [5, 6, 7, 8, 9] though occurrence of PDA observed more in males as up to 53.0 % in a research study by Rothman KJ in 1976 [10]. Results of current study also show the female to male ratio as 2:1 which mean that female may be also a leading factor guiding towards PDA.

Premature children are more commonly affected by PDA than the normal borne children. Low weight of new borne babies less than 2.5 kg observed up to 30.0% likely to infected of PDA. But in the present study the data regarding gestational age could not be gathered that is why pregnant women should be very careful for the completion of gestational period to minimize the chance of development of PDA. The relation ship of birth weight and gestational age is in reverse related to PDA occurrence. Because of PDA 40 % children having weight < 01 kg and 20 % children having weight in between of 01kg to 1.5 kg treated with hemodynamically significant shunt [11]. Mean weight and height of the patients at the time of

treatment was as 24.9 ± 11.330 kilo gram and 3.510 ± 1.182 feet accordingly. With minimum and maximum weight as 08 kg and 56 kg respectively, the readings are so because there in the study age groups age of >10 years also included.

With maternal diabetes the chance of PDA rises [12,13,14]. Children of the mothers having phenylketonuria noticed to have developed PDA [15]. Found no relation among hyperthyroidism or maternal hypothyroidism [16] or influenza and Patent Ductus Arteriosus (PDA). PDA risk related with upper respiratory infection and fever however not with sauna bathing or workplace temperature, according to the examination report of a study on relationship among maternal hyperthermia and PDA [17]. According to an opinion there is no relationship of maternal ampicillin usage and PDA [18]. Findings of a research shows that maternal smoking increases the risk of PDA [19] where as various other research studies found no such relation of smoking of parents [20, 21]. Direct smokers as mother and indirect smokers as father also observed in 63.60 % cases in the present observational study.

CONCLUSION:

Factors of PDA concluded during current study are controllable and hence occurrence of it can also be reduced. Etiological reasons for occurrence of PDA concluded through this study are low birth weight, usage of medicine by pregnant women, parents smoking habits, infections during pregnancy, premature birth and feminine gender. Present research was having a small sample size and setup and more research is needed on a large scale to sort out the reasons of PDA conditions and to find out

ways to eliminate it.

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