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Factors Associated with Intestinal Atresia and Its Complications

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ABSTRACT
Intestinal atresia occurs as 1.3 to 3.5 cases per 10,000 live births, and the understanding of the factors associated with occurrence and complications of intestinal atresia. The current study's goal is to evaluate the various forms of intestinal atresia, and factors associated with intestinal atresia and its complications. Thirty-two infants diagnosed with intestinal atresia were included in the current study. The study was conducted at Al-Zahra Teaching Hospital in Al-Najaf city, in Iraq, during the period between October 2018 to March 2021. The results of the current study show most of neonates have gestational age of 36 weeks (37.5%), those with birth weight less than 2.5Kg (75%), those age at presentation between (4-5) days (50%), those with hospital stay (4-7) days (46.9%), male patients (59.4%), those with no associated anomalies (65.6%), those with no complications (68.8%), type is IIIa (28.1%), and finally only (18.8%) of them had died. The results of the current study show the significant relationship between type of intestinal atresia with complications (p value = 0.02). It was concluded that the most common type of jenunoileal atresia is IIIa. There is an association between complications of intestinal atresia and each of: birth weight, gestational age and hospital stay. It was also concluded relationship between type of intestinal atresia and complications.

Keywords: *intestinal atresia, duodenal, jejunoileal, associated anomalies.*

1. INTRODUCTION

A congenital defect in a hollow viscus that fully closes the lumen is known as ductal atresia. One of the most common causes of bowel blockage in new-borns is intestinal atresia, which may appear at any location in the digestive system. The duodenum is a big component in one-half of the cases [1].

The reported incidence of intestinal atresia ranges from 1.3 to 3.5 per 10,000 live births, of which approximately 20 percent are associated with a chromosomal anomaly. The incidence and accompanying abnormalities vary depending on the anatomical site: Duodenal atresia affects around 1 in every 10,000 new-borns and accounts for up to 60% of all small intestinal atresias. Approximately 30 percent of infants with duodenal atresia have a chromosomal anomaly, primarily Down syndrome [2] .

In recent decades, intensive care, surgical treatments, and artificial feeding have all improved the survival rate of most vulnerable infants with congenital Jejunoileal Atresia (JIA).The selection of surgical options aims to ensure that the longest length of the intestine is spared even if it must be passed via numerous anastomoses [2], and duodenal atresia (DA) is a congenital intestinal blockage that affects one in every 5000–10,000 live births and affects males more often than girls [3]. Additionally, more than 50% of babies with DA are found to have an underlying congenital abnormality, such as (vertebral defects, anal atresia, cardiac defects, tracheo-esophageal fistula, renal anomalies, and limb abnormalities) which stand for (VACTERL). Gastrointestinal abnormalities are most frequently seen in the gastrointestinal tract. If in this instance, the most frequently related abnormalities are annular pancreas, intestinal malrotation, and intestinal atresia and/or stenosis, the anomaly that most commonly appears is intestinal atresia and/or stenosis [4] .

It's really well-known that a missing postoperative anastomosis or intestinal web may induce postoperative bowel blockage, an increased hospital stay, and more time on parenteral nutrition because of a delay in starting feeds. This section is occupied by individuals who advocate laparoscopic surgery and others who favor an open procedure [5] . An solitary occurrence of a condition is called a singleton. They may be combined

with other congenital abnormalities, or may be associated with a chromosomal anomaly, namely trisomy 21. According to studies, approximately one-third of individuals identified with duodenal atresia prenatally had Down syndrome, and 3–5% of those with trisomy 21 have duodenal atresia [6]. The study's main goal is to examine the many kinds of intestinal atresia, as well as related variables.

2. PATIENTS & METHODS

Thirty-two infants diagnosed with intestinal atresia were included in the current study. The study was conducted at Al-Zahra Teaching Hospital in Al-Najaf city, in Iraq, during the period between October 2018 to March 2021. The following data have been collected: ((Type of intestinal atresia, Gestational Age, Age at presentation, Birth Weight, Hospital Stay, Gender, Associated Anomalies, Complications)). Statistical analysis was done by SPSS program (version 25) including both descriptive (frequency and percentage) and inferential statistics (Chi square).

3. RESULTS

Table (1) demonstrates the general features of the research sample, it explain the highest percentage of the children subgroup are: those with gestational age of 36 weeks (37.5%), those with birth weight less than 2.5Kg (75%), those age at presentation between (4-5) days (50%), those with hospital stay (4-7) days (46.9%), male patients (59.4%), those with no associated anomalies (65.6%), those with no complications (68.8%) , and finally only (18.8%) of them had died .

Table (2) shows the descriptive statistics of the types of intestinal atresia, it shows that the most prevalent type is IIIa (28.1%).

Table 1. General characteristics of the study sample

Items	Sub-groups	Freq.(Total = 32)	Percent.
Gestational Age / Weeks	35	8	25.0
	36	12	37.5
	37	7	21.9
	38	5	15.6
Mean ± SD (Range) : 36.28±1.02 (35-38)			
Birth Weight / Kg	< 2.5	24	75
	≥ 2.5	8	25
Mean ± SD (Range) : 2.22±0.42 (1.6-3.1)			
Age at presentation	2-3	12	37.5
	4-5	16	50
	6-7	4	12.5
Mean ± SD (Range) : 4.03±1.47 (2-8)			
Hospital Stay/ days	0-3	6	18.8
	4-7	15	46.9
	8-11	11	34.4
Mean ± SD (Range) : 4.03±1.47 (2-8)			
Gender	Male	19	59.4
	Female	13	40.6
Associated Anomalies	Yes	21	65.6
	No	11	34.4
Complications	Death	6	18.8
	Present	4	12.5
	Absent	22	68.8

Table 2. Descriptive statistics of the types of intestinal atresia

Items		Frequency (Total = 32)	%
Duodenal		6	18.8
Jejuno-Ileal Atresia	I	8	25.0
	II	4	12.5
	IIIa	9	28.1
	IIIb	1	3.1
	IV	4	12.5

Table (3) is about relationship between neonates characteristics and the type of intestinal atresia, it shows that there is no significant relationship except with Complications in which there was significant relationship (p value = 0.02). Table (4) reveals the values of Chi square values for the relationships between different neonates characteristics, it shows that there is a significant relationship between GA and BW (Chi square = 25.23) ; and between complications and each of : Birth Weight (Chi square = 9.54), Gestational Age (Chi square = 8.23), and hospital stay (Chi square = 11.49).

Table 3. Chi square values for the relationships between different neonates characteristics

Items	Birth Weight	Gestational Age	Age at presentation	Hospital Stay	Gender	Associated Anomalies
Gestational Age	25.23*					
Age at presentation	2.10	2.21				
Hospital Stay	3.12	1.32	1.56			
Gender	2.36	3.27	2.03	0.33		
Associated Anomalies	1.25	1.15	0.98	0.26	0.65	
Complications	9.54*	8.23*	0.88	11.49*	0.94	1.36

Table 4. Relationships between neonates characteristics and type of intestinal atresia

Items	df	Chi Square	P value
Gestational Age	15	1.86	0.33
Birth Weight	5	1.41	0.51
Age at presentation	10	2.21	0.26
Hospital Stay	10	1.32	0.49
Gender	5	3.27	0.65
Associated Anomalies	5	1.15	0.94
Complications	10	22.02	0.02

4. DISCUSSION

The clinical characteristics of the studied neonates come in accordance to a previous study that indicated the male constitutes about (58.1%) of the total neonates with JIA, the average gestational age was 36 weeks. (range 27–41) and mean birth weight (BW) was 2.644 g (range 730 – 4.120, SD 785) [7]. Regarding the type of, our study may agree with Stollman et al. (2009) who found that the distribution of the types of jejunoileal atresia was as follows: 16%, 21%, 24%, 10%, and 22% for : type I , type II, type IIIa , type IIIb, and type IV respectively [8].

Duodenal atresia mortality rates have decreased dramatically during the last three decades, averaging 2% to 5%. The procedure is not directly linked to mortality rates, but other organ abnormalities such as complicated congenital heart problems are. Survival rates are improving because to improved NICU care, nutritional

assistance, and paediatric anaesthetic. Long-term survival of most babies with duodenal atresia (more than 80%) is now the norm. The use of endoscopy to remove the duodenal web is likely to be the most contentious issue in the future. This method is still being tested. Another point of contention is when the patient should be fed following surgery [9].

The median birth weight was considerably lower (median 2,550 vs. 2,980 g) There were no changes in gender, preterm, small for gestational age, birth weight, cardiac abnormality, type of atresia, primary anastomosis, or complication grade $\geqslant$ 2 in the group with a longer hospital stay ($p = 0.04$). or residual bowel length. [10[. Regarding complications, the results of the current study matches other studies which found complication rates between 18 to 46% [11-12].

The difference in complication rate may be explained by the number of various problems examined, and the present research included central line issues, which had not previously been included in investigations. As a consequence, central line issues including infection, thrombosis, and dysfunction were the most common in this study. Infants with any central line issue took considerably longer to finish enteral feeding and were hospitalized for significantly longer periods of time. When a central line malfunction occurs, time with parenteral nutrition is often prolonged, and there is often a need for a surgical intervention under general anesthesia, which temporarily disrupts and prolongs time to complete enteral feeding, thus extending hospital stay. The causation may, however, be inverted; the longer the babies remain on parenteral nourishment or in the hospital, the higher the chance of having a central line problem [13]. Low birth weight has been linked to an increased risk of death in JIA patients. Previous research has linked low birth weight to a more difficult postoperative period [10].

5. CONCLUSION

It was concluded that the most common type of jenunoileal atresia is IIIa. There is an association between complications of intestinal atresia and each of: birth weight, gestational age and hospital stay . It was also concluded relationship between type of intestinal atresia and complications

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