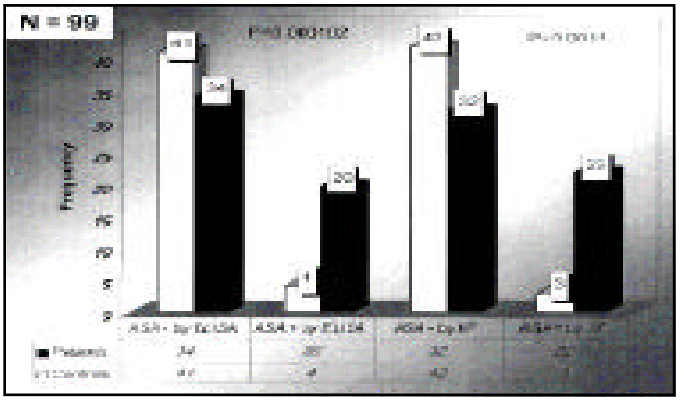

Figure 1 - Prevalence of ASA in unexplained infertility group (54 males and females) determined by indirect immuno-fluorescence (IIF) and enzyme linked immunosorbent assay (ELISA).

Table 1 - Age group-distribution of unexplained infertile patients and controls in accordance with the presence of ASA in their serum.

Method	Category one (≤30 years)	Category 2 (31-35 years)	Category 3 (36-40 years)	Category 4 (>40 years)
ASA+ by IIF	6	6	10	3
ASA- by IIF	21	20	24	15
ASA+ by ELISA	5	7	8	4
ASA- by ELISA	16	19	26	14

ASA+ = Positivity of anti-sperm antibodies, ASA- =Negativity of anti-sperm antibodies, IIF - indirect immuno fluorescence, ELISA - enzyme linked immunosorbent assay

positive. **Table 1** illustrates the results according to age. The results of investigation of the role of any history of a previous surgery in the reproductive tract in our male patients showed that out of 11 patients with previous surgery, 4 of them were positive in terms of serum-spermatozoa antibodies using the IIF method, and 7 were negative. Out of 19 patients with no previous surgery on their reproductive system, only 7 had spermatozoa antibodies in their serum using the IIF method. Whereas, out of 11 patients with previous surgery, 3 of them were positive in terms of serum-spermatozoa antibodies using the ELISA method and 8 were negative. Out of 19 patients with no previous surgery on their reproductive system, only 8 had spermatozoa antibodies in their serum using the ELISA method.

Statistically, we found that there was a very strong correlation between ASA presence in serum, and unexplained infertility (P=0.000102 using the IIF method, and P=0.0011 using the ELISA method) (**Figure 1**). However, there was no obvious correlation between the presence of spermatozoa antibodies and age or sex. The same conclusion was reached considering any previous surgical history in the reproductive system. These findings strengthen and enhance the theory of the role of ASA in infertility. Thus, application of antisperm antibody detection should become an integral part of the investigation of unexplained infertility.

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Adhesive intestinal obstruction in infants and children

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In adults, the treatment of adhesive intestinal obstruction (AIO) is well established, and conservative treatment in the form of intravenous fluids and nasogastric aspiration form the basis for the initial therapy in selected patients.[1] This however is not the case in the pediatric age group, where the treatment is still controversial.[3-5] One reason for this is that AIO is relatively rare in the pediatric age group. Add to this the lack of consensus regarding the place of conservative treatment of AIO in infancy and childhood. This is a review of our experience in the management of AIO in infants and children. To our knowledge this is the first report regarding AIO in infants and children from the Kingdom of Saudi Arabia.

The medical records of all children admitted with the diagnosis of AIO between June 1989, and December 2000 were retrospectively reviewed for: age at diagnosis, sex, interval between initial surgery and presentation with AIO, presenting symptoms, initial diagnosis, type of operation, treatment and outcome. In all children the treatment was initially conservative and consisted of resuscitation with intravenous fluids and electrolytes, nil by mouth, nasogastric aspiration and close observation. During observation, the following were recorded: temperature, abdominal girth, and

abdominal examination for localized tenderness every 4-6 hours, daily complete blood count and plain abdominal radiographs. The amount and quality of nasogastric aspirate was also recorded. The frequency of these observations were modified according to the response in each case and conservative treatment was continued for those who showed response in the form of decrease in the amount of nasogastric aspirate, no fever, no leukocytosis, no localized abdominal tenderness, and passage of flatus or feces. The presence of localized abdominal tenderness, fever and leukocytosis in the absence of any other cause, or evidence of complete intestinal obstruction, or both, that is persisting or free peritoneal air were considered indications for surgery.

During a 10.5 years period, only 24 infants and children (14 male and 10 female) were admitted with the diagnosis of AIO. Their ages at the time of presentation ranged from 1 month to 15 years (mean 5.35 years and median 5 years), while their ages at initial operation ranged from 2 days to 15 years (mean 4.3 years and median 2.25 years). Time elapsed from initial operation to presentation ranged from 4 days to 7 years (mean 1.2 years and median 2.5 months), and 79.2% of our patients developed AIO within one year from initial operation. The causes necessitating initial surgery are shown in **Table 1**. Only 2 (8.3%) responded to conservative treatment. One of them was 15-years-old male with sickle cell disease who had splenectomy and cholecystectomy for splenic sequestration crisis and gallstones. Postoperatively he developed hematoma at the splenic bed that required reexploration. Ten days postoperatively, he developed AIO that responded to conservative treatment. The other patient was 12-years-old female who had appendecectomy for simple acute appendicitis and developed AIO one year postoperatively. The other 22 children required surgical intervention. In 2 of them there was a single band causing intestinal obstruction, while the other 20 had multiple adhesions. Fourteen of them required releases of adhesions only, while 6 (30%) required resection of small intestines. Three of our patients died giving an overall mortality of 12.5%. One of them was a 1-year-old male who had hydrocephalus and ventriculo-peritoneal shunt. He developed AIO 2 months post insertion of the shunt. Postoperatively, he did well but died of other non related causes. The second patient was a 14 months old female who had Hirschprung`s disease with several attacks of enterocolitis. She also had failure to thrive, malnutrition, and zinc deficiency. She was found to have multiple adhesions and fistula communication between small and large intestines that required resection and end to end anastomosis. Postoperatively, she developed sepsis and died. The third patient was operated on in another hospital at the age of 10 days for congenital pyloric obstruction. Two weeks postoperatively, he presented to our hospital with AIO due to a single band 10 cm from the ileocecal valve. This was released, the bowel resected and end to end anastomosis was carried out. Postoperatively, he developed gram negative septicemia with disseminated intravascular coagulation and died. None of our patients developed clinical recurrence of adhesions.

Table 1 - Predisposing causes for adhesives intestinal obstruction.

Diagnosis and operation	n	(%)
Appendecectomy	6	(25)
Hirschsprung's disease	4	(16.7)
Wilm's tumor	3	(12.5)
Ventriculo-peritoneal shunt	2	(8.3)
Necrotizing enterocolitis	2	(8.3)
Splenic abscess	1	(4.2)
Splenectomy + cholecystectomy	1	(4.2)
Left congenital diaphragmatic hernia	1	(4.2)
Congenital duodenal obstruction	1	(4.2)
Intussuception	1	(4.2)
Volvulus	1	(4.2)
Duodenal perforation	1	(4.2)
Total number of patients	**24**	**(100)**

Intraabdominal adhesions are common complications after laparotomy both in children and adults, but fortunately in only few of them they manifest clinically as AIO. Adhesive intestinal obstruction is one of the most frequent surgical emergencies in adults, and in many countries it is the second most frequent cause of intestinal obstruction after obstructed external hernias. This however is not the case in the pediatric age group where not only AIO is not as common, but the operative procedures that cause it are also variable. The exact incidence of AIO in the pediatric age group is not exactly known and varies from 2.2-8.3% in the literature.[4,5] Over a period of 10.5 years, we treated only 24 children with AIO. The incidence of AIO is also operation related. Our results like others confirm that appendecectomy and subtotal colectomy are the most common prior operations, and the risk of developing AIO is greater when there were more than one prior laparotomy, and when during the prior operation there was already peritonitis.[3,4] This explains the high frequency of AIO in those with Hirschprung`s disease. In a series of 871 children who were appendecectomized, 1.3% of them developed AIO, and this was highest (3.4%) in those who had perforated appendicitis.[7] The interval between initial surgery and development of AIO is also variable. In one series, 80% of patients developed AIO within 3 months of initial operation.[4] On the other hand over 80% of Janik et al[2] series developed AIO within 2 years of the initial laparotomy. The mean interval from initial operation to presentation in our series was 1.2 years, and 79.2% developed AIO within one year of initial operation, but one of our patients developed AIO 7 years after initial surgery. The diagnosis of AIO is not difficult to make, but the treatment is still controversial. Conservative treatment forms the basis of management for AIO in adults and fever, leukocytosis, or localized abdominal

tenderness, or both or complete intestinal obstruction has been set as indications for surgical intervention. This however is not the case in the pediatric age group where the treatment is still controversial. For many years, it has been stated that there is no place for conservative treatment in infants and children with AIO, and to obviate delay in treatment with its attendant risks, increased morbidity and mortality, early surgical intervention was advocated.[3,4] As a result of this aggressive surgical approach a notable decrease both in morbidity and mortality was reported.[3] In our series, only 2 (8.3%) responded to conservative treatment, and 6 (30%) required intestinal resection. It is however, difficult to speculate whether this 30% resection rate could have been reduced by early surgical intervention in our patients. Although our series is small, we like others feel that conservative treatment has a limited place in the management of infants and children with AIO.

Further studies, however are required to substantiate this. With the recent advances in the diagnostic and therapeutic laparoscopy, laparoscopic management of AIO in children is now feasible, safe and an increasingly utilized form of therapy.[8] Being less invasive, laparoscopy should prove valuable towards early surgical intervention in children with AIO.

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