

## Occult celiac disease in adult Omanis with unexplained iron deficiency anemia

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Celiac disease (CD) results from an abnormal response of the small bowel mucosa to gluten peptides derived from wheat. Classically, affected individuals have abdominal distension, malabsorption and diarrhea but in the last few years occult forms of the disease presenting with isolated iron deficiency anemia have been recognized.<sup>1</sup> The disorder is more common in women, is familial and is associated with other autoimmune disease, in particular type 1 diabetes where 2-6% of the patients may be affected.<sup>2</sup> It is more common in the Northern and Western hemisphere with declining incidence as you move to the East and towards the equator. Not surprisingly, therefore less than 10 cases were diagnosed in our pediatric and none in the adult population in our hospital over the last 10 years. On the other hand iron deficiency anemia is common here and attributed mainly to dietary iron lack. To investigate the possibility that some of these individuals might have occult CD, a small group of patients with unexplained iron deficiency were screened for CD disease, using antiendomysial antibody (AEA) titres, a highly specific and sensitive assay.<sup>3</sup> Serum samples were obtained from 51 consecutive patients with unexplained iron deficiency anemia attending general endocrine, hematology and student health clinics in Sultan Qaboos University Hospital, Muscat, Oman. The samples were separated, frozen and analyzed in London, United Kingdom (UK). Samples were analyzed for immunoglobulin A (IgA) and immunoglobulin G (IgG) anti-tissue transglutaminase (tTG) antibodies, using the method described by Sulkanen et al.<sup>3</sup> Positive IgA tTG was followed up with IgA antiendomysial antibodies (EMA). In the case of positive IgG tTG, in the absence of IgA tTG, selective IgA deficiency was excluded by measuring total serum IgA and IgG1 EMA. All patients with positive serology were offered endoscopy and small bowel biopsy to confirm the diagnosis. Forty-three patients were female, ages ranged from 17-61 (mean 23), hemoglobin ranged from 5.9 to 11.3 (mean 9) with confirmed low serum ferritin. Two of them were found to have positive IgA tTG and IgA EMA. Two patients had positive IgG tTG, but neither of these were selectively IgA deficient, nor did they have IgG1 EMA. One of these patients has been biopsied, histology of which showed sub-total villous atrophy, the other refused to have endoscopy. Both patients were advised to take a gluten-free diet. This is the first reported use of EMA titres as a screening test for the presence of CD in the Arabian peninsula. Our preliminary observations

confirm the presence of occult CD in Oman and indicate a prevalence similar to that occurring in the UK, where approximately one in 30 patients with iron deficiency and 1 in 200-300 of the general population are affected.<sup>1,4</sup> The continuing use of rice as the major dietary carbohydrate here would explain the lack of overt disease in adults but increasing imports of wheat containing foods might change all this as seems to be the case in Jordan.<sup>5</sup> Obviously a much larger population should be screened to confirm or refute our conclusions. Celiac disease affects 2-6% of type 1 diabetes patients in Europe and we are currently investigating CD prevalence among type 1 diabetics in Oman.

In conclusion, we recommend that occult CD should be considered in any Omani patient with unexplained iron deficiency anemia.

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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.<sup>1</sup> This however is not the case in the pediatric age group, where the treatment is still controversial.<sup>2-5</sup> 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

Table 1 - Predisposing causes for adhesive intestinal obstruction.

Diagnosis and operation	n	(%)
Appendectomy	6	(25)
Hirschprung'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)
Intussusception	1	(4.2)
Volvulus	1	(4.2)
Duodenal perforation	1	(4.2)
<b>Total number of patients</b>	<b>24</b>	<b>(100)</b>

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 leucocytosis, no localized abdominal tenderness, and passage of flatus or feces. The presence of localized abdominal tenderness, fever and leucocytosis 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 a 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 appendectomy 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.

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.<sup>4,5</sup> 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 appendectomy 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.<sup>3,4</sup> This explains the high

frequency of AIO in those with Hirschsprung's disease. In a series of 871 children who were appendectomized, 1.3% of them developed AIO, and this was highest (3.4%) in those who had perforated appendicitis.<sup>5</sup> 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.<sup>4</sup> On the other hand over 80% of Janik et al<sup>2</sup> 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, leucocytosis, 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.<sup>3,4</sup> As a result of this aggressive surgical approach a notable decrease both in morbidity and mortality was reported.<sup>3</sup> 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.<sup>6</sup> Being less invasive, laparoscopy should prove valuable towards early surgical intervention in children with AIO.

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## Ultrasound as a primary tool to evaluate patients with blunt abdominal trauma

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Fifty-five cases of patients with blunt abdominal trauma (BAT) treated at Wrexham Maelor Hospital, United Kingdom, between February 1996 and February 1998 were studied retrospectively. Ultrasound was performed in all patients in the Radiology Department which is in the complex of Accident and Emergency (A&E) building a few meters from the resuscitation rooms. US was carried out by radiologist using toshiba machine with a 3.5MHz transducer. The objectives of the examination were screening for intra-abdominal fluid and solid organ injury. True-positive (TP), true-negative (TN), false-positive (FP), and false-negative (FN) rates were determined. These rates were used to calculate the sensitivity (TP/TP+FN), specificity (TN/TN+FP) and accuracy (TP+TN/TP+TN+FP+FN) of US. Positive predictive value (PPV) (TP/TP+FP), and negative predictive value (NPV) (TN/TN+FN) was also calculated. Fifty-five cases of patients with BAT, who were treated at Wrexham Maelor Hospital, from February 1996 through to February 1998 was analyzed. There were 33 males (60%) and 22 female (40%) patients, with a mean age of 36.4 years (range 4-85 years). Associated injuries occurred in 40 patients (72.6%). Road traffic accidents accounted for 59.5% of injuries. Falls accounted for 29%, assault accounted for 7.2%, trauma inflicted by animals accounted for 7.2% and convulsions accounted for 1.8%. Ultrasound examination was performed within 5-30 minutes of patient admission to A&E Department. The time required to complete the examination was 5-10 minutes. The presence of free fluid collection was observed in 7 cases. Liver contusion and hematoma was detected in 2 cases. Splenic parenchymal damage and hematoma was observed in 6 cases. Sixteen patients had positive US examinations, and 39 patients had negative US examinations. One patient with positive US finding underwent a computed tomography scan examination which was negative, and this was the only false-positive US finding in this study. Thirteen patients (23.5%) out of 55 patients underwent surgery, 12 patients with positive US results and one with a negative US result. In this study the US sensitivity is 94% with a PPV of 0.94.