EXTENDED REPORT

Abdominal manifestations in childhood-onset systemic lupus erythematosus

O Richer, T Ulinski, I Lemelle, B Ranchin, C Loirat, J C Piette, P Pillet, P Quartier, R Salomon, B Bader-Meunier, for the French Pediatric-Onset SLE Study Group

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See end of article for authors' affiliations

Correspondence to:
B Bader-Meunier, Service de
Pédiatrie Générale, Hôpital
de Bicêtre, 78 rue du
Général Leclerc, Le Kremlin
Bicêtre 94276, France;
brigitte.bader-meunier@bct.
ap-hop-paris.fr

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Background: Childhood-onset lupus erythematosus is a rare disorder of unknown origin.

Objectives: To describe the frequency of gastrointestinal manifestations at presentation of systemic lupus erythematosus SLE and at follow-up, and discuss the specific causes of these manifestations.

Methods: Medical records of 201 patients with childhood-onset SLE followed up in French paediatric nephrological, haematological and rheumatological centres were reviewed and abstracted for gastrointestinal manifestations.

Results: Gastrointestinal involvement was recorded in 39 (19%) children. The median (range) age at the time of initial gastrointestinal manifestations was 11.3 (4.5–16) years. Gastrointestinal symptoms were present at or occurred within 1 month after diagnosis in 32% patients. Abdominal pain was the most frequent symptom, present in 34 (87%) patients. It was mostly related to lupus involvement, especially ascites (n = 14) and pancreatitis (n = 12), more rarely to treatment-induced events (n = 1) or infection (n = 1) and never to events unrelated to SLE. Three children with surgical abdomen underwent a laparotomy before SLE was diagnosed, with a final diagnosis of lupus peritonitis and lupus acalculous cholecystitis. C reactive protein values were <40 mg/l in all but two patients who had surgical abdomen. Abdominal ultrasonography and computed tomography scans were abnormal in 58% and 83% of the evaluated patients, respectively. Corticosteroids, associated with intravenous cyclophosphamide in eight patients, led to complete remission of gastrointestinal involvement in 30 of 31 treated patients.

Conclusion: Gastrointestinal involvement is common in children with SLE, and is mainly due to primary lupus involvement. Corticosteroid treatment should be promptly considered in children with lupus presenting with abdominal pain after infectious disease; side effects of treatment and intestinal perforation have been excluded.

Systemic lupus erythematosus (SLE) is a systemic disease affecting 10–15% of children and adolescents. In these childhood-onset patients, the initial symptoms are generally more severe, with more aggressive nephritis, neurological and haematological involvement.^{1–3} The incidence of abdominal involvement varied from 8% to 40% of patients adult-onset SLE,^{4,5} but has been considered previously in only two paediatric series.^{6,7} Additionally, the extent of gastrointestinal tract involvement in patients with SLE as a whole is unknown, and their short- and long-term outcomes in childhood-onset SLE remains unclear. The analysis of this non-classic presentation may allow better understanding of its contributing factors and earlier appropriate management.

We conducted a retrospective multicentre study to show the frequency of gastrointestinal manifestations at initial presentation of SLE and at follow-up, and to discuss the specific causes of these manifestations.

METHODS

Patients and inclusion criteria

Data from patients with SLE diagnosed before 16 years of age and followed in French paediatric departments have been compiled in a computerised bank in a standardised form. The diagnosis of SLE was based on the American College of Rheumatology criteria.⁸ The database was initially created for a retrospective study of SLE and included inpatients and outpatients with SLE followed up between January 2002 and March 2003. Enrolment has been prospective since 2003. All French paediatric nephrology, rheumatology and haematology

teams were invited to participate in this survey. At the end of 2004, 201 patients had been included in the database. Patient inclusion also required the presence of gastrointestinal involvement that was either present at the time of SLE diagnosis (or within the following month) or occurred during the course of SLE. In December 2004, 39 patients in the database fulfilled these criteria.

Data collection

We retrospectively reviewed the medical charts of these patients with respect to demographics, clinical presentation, laboratory, radiological and endoscopic findings and treatment. We categorised abdominal and gastrointestinal manifestations into the following 12 items: abdominal pain, diarrhoea, vomiting, dysphagia, ascites, intestinal occlusion, acute pancreatitis, acute cholecystitis, peritonitis, haematemesis, melena and ischaemic bowel disease. We further differentiated these patients into those with or without surgical abdomen, defined as severe gastrointestinal manifestation that led to surgery. Pancreatitis was defined as an increase in blood amylase or lipase activities; acute pancreatitis was considered if abdominal pain was associated. Chronic intestinal pseudo-obstruction (CIPO) was defined by the occurrence of clinical features suggestive of bowel obstruction, resulting from ineffective intestinal propulsion. Ischaemic bowel disease was diagnosed if at least three of the following signs were seen on a computed

Abbreviations: CIPO, chronic intestinal pseudo-obstruction; CRP, C reactive protein; ESR, erythrocyte sedimentation rate; Ig, Immunoglobulin; SLE, systemic lupus erythematosus

tomography scan: bowel wall thickening, target sign, dilatation of intestinal segments, engorgement of mesenteric vessels and increased attenuation of mesenteric fat.⁹ Acute lupus peritonitis resulted from peritoneal inflammation and presented as a painful and rigid abdomen, often associated with ascites. Results of gastroscopy, colonoscopy, abdominal ultrasonography and computed tomography scans, values of erythrocyte sedimentation rate (ESR), C reactive protein (CRP) and presence of antibodies anti-dsDNA and antiphospholipid were also noted. Clinical extraintestinal lupus manifestations were also recorded. We used the events recorded within the first week after diagnosis of gastrointestinal manifestation. The criteria for renal involvement were proteinuria (>0.5 g/d) or cellular casts in urine analysis. Renal biopsy specimens were classified according to that proposed by the World Health Organization, into type I (normal), type II (mesangial glomerulonephritis), type III (focal proliferative glomerulonephritis), type IV (diffuse proliferative glomerulonephritis) and type V (membranous nephropathy). The criteria for haematological involvement were haemolytic anaemia, thrombocytopenia ($<100 \times 10^9/l$), leucopenia ($<4 \times 10^9/l$) or lymphopenia ($<1.5 \times 10^9/l$). Musculoskeletal manifestations included arthritis, arthralgia or myalgia. Antinuclear antibody levels $\geq 1:80$ were considered significant. Antiphospholipid antibodies were considered to be positive in patients with lupus anticoagulant or significant anticardiolipin immunoglobulin (Ig) G or M levels, according to normal laboratory ranges. Non-gastrointestinal involvements which required ≥ 0.5 mg/kg/day of prednisone or were responsible for a life-threatening organ dysfunction at the time of gastrointestinal involvement were regarded as severe. When it was possible, gastrointestinal manifestation was classified as primary SLE involvement, a treatment or infection-related event; in some patients, no cause could be found. Primary SLE involvement was considered when gastrointestinal involvement responded to specific SLE treatment. A treatment-related event was suspected if it occurred in a patient who received drugs with potential gastrointestinal side effects, in the absence of any other cause.

Figure 1 Symptoms of abdominal involvement in 39 patients with paediatric systemic lupus erythematosus according to the type of involvement. CIPO, chronic intestinal pseudo-obstruction.

An infection-related event was considered if systemic or gastrointestinal infection was found.

RESULTS

Patients

In all, 39 patients with gastrointestinal involvement, an overall prevalence of 19%, were identified. The median (range) age of diagnosis of SLE for those with abdominal involvement was 11.3 (4.5–16) years. The female:male ratio was 6:1. Among the 39 children, 35% were Caucasian, 34% were black, 17% were north African and 14% were Asian. The median (range) follow-up was 5.5 (0–14) years. No significant differences in the median age of diagnosis, female:male ratio and ethnic distribution between the subgroups of patients with SLE with and without gastrointestinal involvements were found (data not shown). Seven patients in whom SLE was previously diagnosed were treated with corticosteroids, two with intravenous cyclophosphamide, one with azathioprine, one with ciclosporin and one with aspirin.

Clinical features

Abdominal manifestations were present at diagnosis of SLE in 32 (82%) patient, and occurred during a subsequent relapse (time interval from diagnosis: 2 months to 2.5 years) in the remaining 10 (26%) patients. Abdominal pain was the most frequent finding (34 patients, 87%; fig 1). Abdominal pain was the sole involvement at onset of SLE in four patients, of whom three had fever. The pain was either diffuse ($n = 32$) or located in the right-lower-abdominal quadrant ($n = 2$). Five patients had surgical abdomen, which led to laparotomy. Table 1 lists the other digestive symptoms. In all, 14 patients developed ascites, resulting from nephrotic syndrome in 2 patients; in the remaining 12 patients it was associated with other abdominal involvement ($n = 9$) and was the sole presenting sign in 2 patients with lupus peritonitis and in one girl presenting with an isolated refractory ascites for 2 years. The ascitic fluid was inflammatory in the five children whose ascites was punctured, in one patient it was associated with the presence of

Table 1 Gastrointestinal manifestations in 39 patients with paediatric systemic lupus erythematosus

	All patients (n = 39) n (%)	Primary SLE	Infection	Drug- induced	Unknown cause
Abdominal pain	34 (87)	31	1*	2	0
Vomiting	11 (28)	11	0	0	0
Diarrhoea	11 (28)	10	1*	0	0
Melena	2 (5)	2	0	0	0
Haematemesis	1 (2.5)	0	0	0	1
Dysphagia	4 (10)	4	0	0	0
Gastritis	1 (2.5)	1	0	0	0
Duodenitis	1 (2.5)	0	0	1	0
Rectitis	1 (2.5)	1	0	0	0
Haemorrhoidal thrombosis	1 (2.5)	0	0	0	1
Surgical abdomen	5 (13)	5	0	0	0
Ascites	14 (36)	14	0	0	0
Peritonitis	2 (5)	2	0	0	0
Intestinal occlusion	1 (2.5)	1	0	0	0
Pancreatitis/acute pancreatitis	12 (31)/ 11 (28)	11/10	0/0	1/1	0/0
Enteritis	3 (7.5)	3	0	0	0
Cholecystitis	1 (2.5)	1	0	0	0
All manifestations	105 (100)	97 (92.4)	2 (1.9)	4 (3.8)	2 (1.9)

GI, gastrointestinal; SLE, systemic lupus erythematosus.

A single patient may have ≥ 2 GI manifestations.

*One patient with cytomegalovirus infection presented with abdominal pain and diarrhoea.

mesothelial cells. In this patient, an exploratory coelioscopy also found hyperplasic lesions of peritoneum.

Aetiologies of gastrointestinal involvement

Figure 1 presents the aetiologies of gastrointestinal involvement according to the different symptoms. Abdominal pain was related to lupus involvement ($n = 31$), steroid toxicity ($n = 2$) or cytomegalovirus infection ($n = 1$; fig 2). Pancreatitis occurred at onset of SLE in eight children and during the course of the disease in four. Serum amylase levels ranged from 2 to 10 times normal values. It occurred in a setting of generalised severe SLE flare, and required hospitalisation in an intensive care unit in three patients. Increasing the previous dosage of corticosteroids or initiating corticosteroid treatment resulted in a resolution of symptoms and a decrease in pancreatic enzymes in 11 children. Recurrent episodes of pancreatitis occurred after increasing the corticosteroid dosage in one child; they were believed to be related to treatment. Appendicitis was suspected before the diagnosis of SLE in three patients, with final diagnoses of lupus peritonitis ($n = 2$) and lupus acalculous cholecystitis ($n = 1$). Enteritis ($n = 3$) and CIPO, associated with bilateral ureterohydronephrosis ($n = 1$) occurred during the course of SLE.

Associated extraintestinal lupus manifestations

Gastrointestinal involvement was associated with others in 35 patients, including haematological ($n = 29$), cutaneous ($n = 28$), renal ($n = 24$), articular ($n = 19$), pulmonary ($n = 14$), cardiac ($n = 12$) and central nervous system involvement ($n = 9$). Twenty three patients presented with one to three severe non-gastrointestinal involvements, including type III or type IV lupus glomerulonephritis ($n = 13$), autoimmune haemolytic anaemia ($n = 9$) or thrombocytopenia, neurolupus ($n = 5$), severe cardiopulmonary involvement ($n = 2$) and severe cutaneous vasculitis ($n = 1$). One patient with severe pancreatitis had macrophagic activation. Abdominal ascites was associated with pericarditis in five patients and pleuritis in ten.

Figure 2 Cause of gastrointestinal (GI) involvement in 39 patients with paediatric systemic lupus erythematosus.

Abdominal radiological, gastrointestinal endoscopic and manometry findings

Abdominal ultrasonography showed abnormalities in 15 of 26 (58%) evaluated patients, including ascites ($n = 15$) and enlarged pancreas ($n = 1$). Abdominal computed tomography scan was abnormal in 5 of 6 (83%) evaluated children, showing enlarged pancreas, dilated bowel and focal or diffuse bowel wall thickening, (ischaemic bowel disease, CIPO) ascites and bilateral ureterohydronephrosis. Upper gastrointestinal endoscopy showed gastritis in one patient. Oesophageal manometry evidenced an increase of lower oesophageal pressure in one patient with dysphagia.

Laboratory findings

The mean (range) CRP concentration was 29 (4–200) mg/l and mean (range) erythrocyte sedimentation rate (ESR) was 88 (16–136) mm/h. The CRP concentration was <40 mg/l in all but three patients who had either surgical abdomen ($n = 2$) or severe pancreatitis with hypovolemic shock; none of these three patients had infection and only one had associated serositis. The mean CRP concentration was 9 (4–17) mg/l and 48 (4–200) mg/l in patients with ascites and pancreatitis, respectively. The ESR was >50 mm/h in all but two patients who had CIPO and isolated chronic ascites; mean ESR was 104 (75–130) mm/h and 78 (2–124) mm/h in patients with pancreatitis and ascites, respectively. Antinuclear antibodies and anti-double-stranded DNA antibodies were found in 38 (97%) and 36 (92%) patients, respectively. aPL antibodies were found in 14 of 35 (40%) evaluated patients, including those with pancreatitis (3/10), ascites (6/14), peritonitis (1/2) and diarrhoea (4/11).

Treatment and outcome

A total of 31 patients received prednisone (0.5–2 mg/kg/day); 6 patients received intravenous methylprednisolone because of associated lupus nephritis ($n = 4$), macrophagic activation ($n = 1$) or severe pancreatitis ($n = 1$); 10 patients received cyclophosphamide in combination with steroids either because of severe non-gastrointestinal lupus involvement ($n = 9$) or because of severe gastrointestinal involvement with a CIPO ($n = 1$). Steroid treatment was effective in all patients with ischaemic bowel disease, ascites, in 11 of 12 patients with pancreatitis and in the patient with CIPO, who received associated intravenous cyclophosphamide. Diarrhoea was considered to be a lupus manifestation because it regressed under corticosteroid treatment in 10 patients. No relapse of gastrointestinal manifestations occurred in patients with pancreatitis and diarrhoea. Conversely, all patients with ischaemic bowel disease and CIPO relapsed after discontinuation of steroids, within 3 months to 3 years after the first manifestation. No patient died during the 0–15 years (median 4 years) of follow-up. Abdominal surgery was performed in five patients: three children with surgical abdomen underwent a laparotomy before SLE was diagnosed, with a presumed diagnosis of appendicitis and a final diagnosis of lupus peritonitis ($n = 2$) and lupus acalculous cholecystitis ($n = 1$). Laparotomy was performed in two other children who had known SLE and who were receiving corticosteroid treatment because of a suspected, but not confirmed, intestinal perforation and because of intestinal occlusion disclosing ileitis and vasculitis of the small omentum.

DISCUSSION

This retrospective study emphasises that abdominal manifestations are common in childhood-onset SLE, and underlines that they are mainly related to primary involvements of SLE.

Abdominal pain was an almost constant sign, observed in 87% of patients. It was mostly related to lupus involvement,

especially ascites and pancreatitis, more rarely to treatment-induced events or infections and never to events unrelated, directly or not, to lupus. This finding differs from the conclusion of some adult-onset SLE series and has major therapeutic implications. In a small series reporting on 13 adult patients with SLE with abdominal pain, 9 patients required surgery for cholecystitis, perforated ulcers, colonic perforations, diverticulitis and adhesions, whereas none of the performed laparotomies were negative owing to non-surgical complications such as polyserositis, enteritis, mesenteric infarction or ascites. The authors concluded that most patients with lupus with abdominal pain have conventional illness, similar to that occurring in those without SLE.¹⁰ However, as the incidence of conventional illness increases with age, except for appendicitis, the causes of abdominal pain may differ considerably between adult and paediatric patients with SLE.

Differentiating a patient with an acute abdomen secondary to SLE as the sole presenting symptom is a real challenge. In our study, three children with lupus gastrointestinal involvement underwent a negative laparotomy because of presumed appendicitis before SLE was diagnosed. Further, patients with known SLE mostly received steroid or immunosuppressive treatment, which may mask the clinical signs of perforation and ischaemia.

Patients presenting with abdominal pain require a thorough investigation, starting with clinical and biological evaluation of SLE disease activity, radiological evaluation, biological screening including antiphospholipid antibodies, pancreatic enzyme activity measurements and search for infection. Evaluation of lupus activity is the first step of the diagnostic procedure. Medina *et al*¹¹ have shown that surgical abdomen was associated with higher Systemic Lupus Erythematosus Disease Activity Index scores in adult patients with SLE who had intra-abdominal vasculitis or thrombosis than in patients with active SLE and non-SLE-related acute abdomen. Unfortunately, we cannot confirm these features in paediatric patients because Systemic Lupus Erythematosus Disease Activity Index scores were not available in our retrospective study. However, one or more severe non-gastrointestinal involvements were present in more than half of the whole population of our study, but in none of the five patients with acute abdomen. We emphasised that most children with lupus had a marked increase of ESR at onset of SLE, but a normal or moderately increased CRP level, except in three children with acute surgical abdomen and severe pancreatitis with shock. Thus, the measurement of ESR and CRP is a valuable tool to suspect SLE in an adolescent with unexplained febrile abdominal pain. Antiphospholipid antibodies may also be responsible for abdominal manifestations. They must be searched for especially in patients with abdominal thrombosis, such as mesenteric or portal thrombosis, Budd–Chiari syndrome and massive intestinal thrombosis.¹¹ However, similarly to Lee *et al*,¹² we found that antiphospholipid antibodies did not correlate with the occurrence of ischaemic bowel disease and that they were detected in less than half of the evaluated patients. Finally, abdominal computed tomography scanning is mandatory in children with lupus who have unexplained abdominal pain; it may show enlargement or abnormal density of the pancreas size, serositis, infectious process, perforation and findings suggestive of ischaemic bowel disease. Lupus ischaemic bowel disease may be considered if three of the following signs are present on a computed tomography scan: increased fluid levels, bowel wall thickening of ≥ 3 mm, target sign, dilatation of intestinal segments, mesenteric oedema and increased attenuation of mesenteric fat and ascites.⁹

We found 6% of pancreatitis in the whole paediatric series, which is similar to the 3–8% rate reported in adult patients.^{13–14}

Pancreatitis usually occurs in the setting of a generalised SLE flare, or as a presenting manifestation, and requires emergency management. The underlying pathophysiology is not known, but microthrombi,^{15–16} vasculitis, intimal thickening, drug toxicity^{17–18} and infection¹⁹ are believed to have a role. The rate of severe and fatal pancreatitis episodes is higher than in patients without SLE. The management of lupus pancreatitis has been controversial, as corticosteroids were thought to be a major pathogenic agent in the past, whereas in most recent studies, as well as in the present series, initiating or increasing steroid treatment results in resolution of pancreatitis in most of the patients.

Ascites disclosed SLE in two patients with lupus peritonitis and in one girl presenting with an isolated refractory ascites for 2 years. Such isolated presenting ascites poses a difficult differential diagnosis. Ascites occurs in 8–11% of adult patients with SLE.²⁰ It usually reflects kidney involvement with nephrotic syndrome, but may also result from severe congestive heart failure, constrictive pericarditis or abdominal manifestations, such as pancreatitis, infarction or perforation of abdominal viscera due to vasculitis or thrombosis, Budd–Chiari syndrome and acute or chronic lupus peritonitis. In acute lupus peritonitis, ascites may develop suddenly, usually associated with abdominal pain and features of lupus flare.²¹ On the other hand, chronic lupus peritonitis usually presents as a painless ascites, and occurs with few or no other manifestations of active lupus.²² Peritonitis is secondary to an involvement of peritoneum that appeared hyperemic, thickened, nodular or adhesive in two thirds of patients with SLE who underwent necropsy.²³

Intestinal vasculitis, acalculous cholecystitis and CIPO were uncommon gastrointestinal manifestations, sparsely reported in previous studies.^{12–24–25} Intestinal vasculitis results from both bowel and mesenteric small-vessel arteritis and venulitis, which may lead to bowel infarction. The mortality is high in adults, but no patient presenting with lupus enteritis died in this study. Intestinal pseudo-obstruction results from a dysfunction of visceral smooth muscle or the enteric nervous system, which may or may not be secondary to vasculitis. Patients present with subacute abdominal pain and distension, vomiting, constipation and weight loss, sometimes associated with ureteric and vesicle smooth muscle involvement, leading to bilateral ureterohydronephrosis that is visible on a computed tomography scan. Antroduodenal manometry shows oesophageal and intestinal hypomotility and delayed gastric emptying. Treatment for CIPO consists of bowel rest with parenteral nutrition and high-dose corticosteroids. In addition, pharmacological stimulation of gut motility can be achieved with octreotide or erythromycin.²⁶ Lupus peritonitis may mimic an acute surgical abdomen caused by severe vasculitis, which results in intestinal ischaemia and perforation. Therefore, it is difficult to determine whether the abdominal pain is due to isolated lupus peritonitis or to an underlying cause, which requires surgery. However, the management of a surgical condition markedly differs from that of lupus peritonitis, which consists of steroid treatment. Abdominal computed tomography scan and laparoscopy can be helpful management. Corticosteroid treatment should be promptly considered in children with lupus presenting with abdominal pain after infectious disease, side effects of treatment and intestinal perforation have been excluded. If patients fail to respond or their condition deteriorates, then early rather than late surgery may improve prognosis.¹¹

Abdominal pain is common in the paediatric population with SLE, and mostly results from pancreatitis and ascites. It is mainly related to primary SLE involvement, and requires high-dose steroids in most of the severe manifestations.

Authors' affiliations

O Richer, B Bader-Meunier, Department of Pediatrics, Hôpital de Bicêtre, Le Kremlin Bicêtre, Paris, France

P Pilet, Department of Pediatrics, Hôpital Pellegrin, Bordeaux, France

T Ulinski, Department of Pediatric Nephrology, Hôpital Trousseau, Paris, France

I Lemelle, Department of Pediatrics, Hôpital Brabois, Nancy, France

B Ranchin, Department of Pediatric Nephrology, Hôpital Edouard-Herriot, Lyon, France

C Loirat, Department of Pediatric Nephrology, Hôpital R Debré, Paris, France

J C Piette, Department of Internal Medicine, Hôpital La Pitié, Paris, France

P Quartier, Department of Pediatric Immuno-Hematology and Rheumatology, Hôpital Necker, Paris, France

R Salomon, Department of Pediatric Nephrology, Hôpital Necker, Paris, France

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Participating centres: M Besnard (Tahiti), M Bodiou (Pointe-à-Pitre), V Bonneville (Lagny), F Bouissou (Toulouse), G Champion (Angers), P Cochat (Lyon), S de Cramer (Toulouse), G Deschênes (Paris), S Devauchelle (Brest), JP Dommergues (Paris), J Donadieu (Paris), A Duquesnes (Lyon), C Fagnoux (Boulogne), M Fishbach (Strasbourg), M Foulard (Lille), S Gandon-Laloum (Caen), H Giudicelli (Antibes), M Guyot (Nantes), E Haddad (Paris), C Job-Deslandre (Paris), I Koné-Paut (Marseille), G Lanthaller (Rouen), C Larroche (Bobigny), MP Lavocat (Saint Etienne), T Leblanc (Paris), B Leluyer (Le Havre), I Lemelle (Nancy), F Liffertman (Dax), C Loirat (Paris), L de Lumley (Limoges), A May (Evry), P Niaudet (Paris), N Perez (Paris), B Pellegrino (Paris), P Pilet (Bordeaux), AM Prieur (Paris), M Rodière (Montpellier), B Roussel (Reims), R Salomon (Paris), A Sans (Pointe-à-Pitre), G Sibille (Basse-Terre), N Sirvent (Nice), C Thomas (Nantes), R de Tournemire (Paris) and M Tsimaratos (Marseille).

REFERENCES

- Tucker LB, Menon S, Schaller JG, Isenberg DA. Adult and childhood-onset systemic lupus erythematosus: a comparison of onset, clinical features, serology and outcome. *Br J Rheumatol* 1995;**34**:866-72.
- Font J, Cervera R, Espinosa G, Pallares L, Ramos-Casals M, Jimenez S, et al. Systemic lupus erythematosus (SLE) in childhood: analysis of clinical and immunological findings in 34 patients and comparison with SLE characteristics in adults. *Ann Rheum Dis* 1998;**57**:456-9.
- Maarten JR, Cate RT, Van Suijlekom-Smit LWA. Childhood-onset systemic lupus erythematosus: clinical presentation and prognosis in 31 patients. *Scand J Rheumatol* 1999;**28**:222-6.
- Hallegua DS, Wallace DJ. Gastrointestinal manifestations of systemic lupus erythematosus. *Curr Opin Rheumatol* 2000;**12**:379-85.
- Sultan SM, Ioannou Y, Isenberg DA. A review of gastrointestinal manifestations of systemic lupus erythematosus. *Rheumatology* 1999;**38**:917-32.
- Bader-Meunier B, Armengaud JB, Haddad E, Salomon R, Deschênes G, Koné-Paut I, et al. Initial presentation of childhood-onset systemic lupus erythematosus (SLE): a french multicenter study. *J Pediatr* 2005;**146**:648-53.
- Le Thi Huong D, Weschler B, Piette JP. Clinical manifestations and outcome of childhood systemic lupus erythematosus: a retrospective study of 50 cases. *Eur J Intern Med* 1993;**4**:15-22.
- Tan EM, Cohen AS, Fries JF, Masi AT, McShane DJ, Rothfield NF, et al. The 1982 revisited criteria for the classification of systemic lupus erythematosus. *Arthritis Rheum* 1982;**25**:1271-7.
- Byun JY, Ha HK, Yu SY, Min JK, Park SH, Kim HY, et al. CT features of systemic lupus erythematosus in patients with acute abdominal pain: emphasis on ischemic bowel disease. *Radiology* 1999;**211**:203-9.
- Al-Hakeem MS, McMillen MA. Evaluation of abdominal pain in systemic lupus erythematosus. *Am J Surg* 1998;**176**:291-4.
- Medina F, Ayala A, Jara LJ, Becerra M, Miranda JM, Fraga A. Acute abdomen in systemic lupus erythematosus. The importance of early laparotomy. *Am J Med* 1997;**103**:100-5.
- Lee CK, Ahn MS, Shin JH, Cho HS, Ha HK, Yoo B, et al. Acute abdominal pain in systemic lupus erythematosus: focus on lupus enteritis (gastrointestinal vasculitis). *Ann Rheum Dis* 2002;**61**:547-50.
- Derk CT, DeHoriatus RJ. Systemic lupus erythematosus and acute pancreatitis: a case series. *Clin Rheumatol* 2004;**23**:147-51.
- Pascual-Ramos V, Duarte-Rojo A, Villa AR, Hernandez-Cruz B, Alarcon-Segovia D, Alcocer-Varela J, et al. Systemic lupus erythematosus as a cause and prognostic of acute pancreatitis. *J Rheumatol* 2004;**31**:707-12.
- Saab S, Corr MP, Weissman MH. Corticosteroids and systemic lupus erythematosus pancreatitis: a case series. *J Rheumatol* 1998;**25**:801-6.
- Lopez SMC, Yebra BM, Bonet LE, Vegazo IS, Hernandez FA, Espinosa LM, et al. Acute pancreatitis and systemic lupus erythematosus: necropsy of a case and review of the pancreatic vascular lesions. *Am J Gastroenterol* 1991;**86**:764-7.
- Kolk A, Horneff G, Wilgenbus K, Wahn V, Gerharz CD. Acute lethal necrotising pancreatitis in childhood systemic lupus erythematosus—possible toxicity of immunosuppressive therapy. *Clin Exp Rheumatol* 1995;**13**:399-403.
- Herskowitz LJ, Olansky S, Lang PG. Acute pancreatitis associated with long term azathioprine therapy. *Arch Dermatol* 1979;**115**:79.
- Ikura Y, Matsuo T, Ogami M, Yamazaki S, Okamura M, Yoshikawa J, et al. Cytomegalovirus associated pancreatitis in a patient with systemic lupus erythematosus. *J Rheumatol* 2000;**27**:2715-17.
- Weinstein PJ, Noyer MN. Rapid onset of massive ascites as the initial presentation of systemic lupus erythematosus. *Am J Gastroenterol* 2000;**95**:302-3.
- Wakiyama S, Yoshimura K, Shimada M, Sugimachi K. Lupus peritonitis mimicking acute surgical abdomen in a patient with systemic lupus erythematosus: report of a case. *Surg Today* 1996;**26**:715-18.
- Kaklamani P, Vayopoulos G, Stamatelos G, Dadinas G, Tsokos GC. Chronic lupus peritonitis with ascites. *Ann Rheum Dis* 1991;**50**:176-7.
- Nadorra RL, Nakazato Y, Landing BH. Pathologic features of gastrointestinal tract lesions in childhood onset systemic lupus erythematosus: study of 26 patients, with review of the literature. *Pediatr Pathol* 1987;**7**:245-59.
- Kamimura T, Mimori A, Takeda A, Masuyama J, Yoshio T, Okazaki M, et al. Acute acalculous cholecystitis in systemic lupus erythematosus: a case report and review of the literature. *Lupus* 1998;**7**:361-3.
- Narvaez J, Perez-Vega C, Castro-Bohórquez FJ, Biosca M, Vilaseca-Momplet J. Intestinal pseudo-obstruction in systemic lupus erythematosus. *Scand J Rheumatol* 2003;**32**:191-5.
- Perlemuter G, Cacoub P, Chaussade S, Wechsler B, Couturier D, Piette JC. Ocreotide treatment of chronic intestinal pseudoobstruction secondary to connective tissue diseases. *Arthritis Rheum* 1999;**42**:1545-9.