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Intestinal ischemia secondary to Covid-19

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ARTICLE INFO

Keywords:
SARS-CoV 2
Kawasaki like
Intestinal ischemia
Medullar aplasia

ABSTRACT

With the wide spread of the current SARS-Cov (Covid-19), it was found that about 2% of children was affected according to several studies, it should be mentioned that Those children are most often asymptomatic, but the current concern is about a vascular inflammatory disease which is similar to Kawasaki disease observed in children with Covid-19.

We report a case of a 9-year-old-girl, known to have idiopathic medullar aplasia, admitted to the emergency department for a pseudo appendicular syndrome with shock, neurological abnormalities and skin lesions. She underwent an emergency surgery; the peroperative exploration suggested an ischemic bowel lesion of the ileal loop and a healthy appendix. The link involving a Covid-19 infection was well established (RT-PCR +).

We shared in common our clinical, radiological, biological and pathological data to draw attention towards the intestinal vasculitis that can be a part in the MIS-C related to Covid 19. To our best knowledge, this is the first case encountered of combination between Covid-19 with intestinal ischemic in children.

1. Introduction

All the way through the spread of the Covid-19 pandemic; the number of children affected has not gone beyond 2% according to several publications (1). throughout the pandemic, authors have reported the appearance of a multi-organ inflammatory syndrome (MIS-C: multisystem inflammatory syndrome in children), which is similar to Kawasaki disease (1,3,4,5,6).

The causal relation with Covid-19 is well confirmed, suggesting an intense immune reaction that occurs late due to a primary viral infection that went unnoticed. The main noticed manifestations are high fever, vasoplegic shock, neurological disorders and almost constant digestive disorders, but right now none of the authors has reported the case of an intestinal ischemia in children.

We report a case of an Algerian girl underwent an emergency surgery for a pseudo appendicular syndrome associated with multisystemic impairment (MIS-C) in an immunosuppressed child.

2. Case description

It’s all about a case of a 09-year-old-girl with a medical history of idiopathic medullar aplasia diagnosed at the age of 3 and was on corticosteroids for one year (5 mg/day, 1 day out of 2 on alternate days) who was examined at the surgical emergency department for a febrile pain of the right iliac fossa which was appeared one day before. It was accompanied by vomiting and diarrhea. Clinical examination of the child determined that the patient was scored 15 based on Glasgow score, the weight was 50 kg (BMI 26.6) with a temperature of 40 °C. The abdomen examination findings determined tenderness of the right iliac fossa.

Laboratory findings were as follows: WBC:1140/μL. HGB:7g/dl. Platelet: 4000 μL. CRP:240mg/l. The abdominal-pelvic ultrasound findings monitored a swollen appendix with a densification of the mesenteric fat with a transonor liquid of medium abundance.

The first decision was considered, to correct and fix the hematological disorders and to combine antibiotics and analgesics. By the end of the transfusion, the child developed a shock: greyish complexion, sinus tachycardia (180 beats/minute), hypotension (60/34
mm hg), an oxygen saturation of 100%, temperature of 39°. She demonstrated hallucinations, confusion, as well as the appearance of an ecchymosis closet like skin lesions on the right lower limb (Fig. 1) and an accentuation of the abdominal pain.

Laboratory findings were as follows: WBC 820/μL. HGB: 6 g/L.

platelet: 45,000/μL. prothrombin: 48%. Blood glucose: 1.2g/l. Urea: 0.45g/l; creatinine 09 mg/l. Natremia: 130 mmol/l, kalemia: 3 mmol/l.

Blood gaz: PH: 7.46. PCO2: 25.9 mm hg. PO2: 121.1 mm hg. Hco2:18.3mmol/l.

A transfusion shock having been eliminated; after the stabilization of the child’s condition The radiological examinations found the same images that were determined by the abdominal ultrasound.

Fig. 1. Skin lesions.

Fig. 2. Thoracic CT-scan showed a ground glass opacities in left lung, thickening and, pleural effusion of small abundance.

Fig. 3. Ileal ischemia.
Both Chest X-ray and thoracic CT-scan showed suggested a ground glass opacities in left lung, pleural effusion of small abundance (Fig. 2). A brain CT scan: was normal

And thus we ended up with an acute appendicular syndrome with shock, neurological signs, skin lesions, respiratory alkalosis and lung lesions. The MIS-C syndrome related to the Covid-19 viral Infection has been evoked on a medullary aplasia.

On account of the worsening of the child’s condition and the accentuation of abdominal pain, the operative decision was performed.

Via right para-median incision, the exploration finds a sero-thematic liquid of average abundance, ischemic ileal lesions on 25 cm–20 cm from the ileocecal crossroads (Fig. 3) and a healthy meso-coeliac appendix (Fig. 4)

Resection of the ischemic loop with double ileostomy is performed.

Post operatively, immunoglobulins then corticoids are administered according to a treatment guideline in addition to antibiotics (cephalosporins + metronidazole + aminosides + azithromycin).

The cytobacteriological study of the peritoneal fluid was 100% lymphocytic.

The RT-PCR of the nasopharyngeal swab was positive.

As a matter of fact pathology demonstrated an hemorrhagic infarction lesions with foci of ischemic necrosis without evidence of thrombus (Fig. 5).

The patient was extubated two days after, The skin lesions had completely disappeared, intestinal transit resumed with functional ileostomy but the patient demonstrated persistence of the same neurological and cardiac disorders with tension peaks went from (150/70 to 240/120 mmhg) and severe pancytopenia.

On the fourth day, the metabolic assessment was very disturbed: besides hepatic cytolysis, renal failure, albumin was: 20 mg/l, CRP 419 mg/l, CKP: 7852 IU/L, D-dimer 13 mg/l, fibrinogen: 5, 48 g/L. troponin 0,023 ng/ml.

On the seventh day: there were an onset of tachypnea with increased oxygen requirements (>10L), requiring respiratory assistance. The patient died on the tenth postoperative day.

3. Discussion

The number of children affected by Covid 19 is about 2% among the general population (2% in the UK, 1.7% of the population in the USA, 1% in the Netherlands [1].

The symptomatology is most often benign (45.5%), the moderate form makes up around 41.5%, while the severe: 4.4%. The critical form 0.9%, the deaths are rare (3 cases), according to a series published by Xiaojian Cui of 2596 children [2].

The digestive disorders related to direct involvement of the virus are rare: diarrhea 6.6%, vomiting 5.8% [2].

All through this pandemic, a multi-systemic inflammatory syndrome (MIS-C) was reported for the first time by Jones VG (USA) on April 7, 2020: a 6-month-old infant with Kawasaki disease related to a positive Covid-19 test [3]. Since then, other cases have been reported related to covid-19 and suggesting a post-viral immune response.

On May 06th, 2020: Righagen (UK) [4] reported a series of 8 cases of MIS-C.

On May 13th, 2020: Verdoni (Italy) [5] published a series of 10 cases (PCR +: 20%, serology IgG +: 80%).

May 14th, 2020 Toubiana (France) [6]: 17 cases (PCR +: 41% and serology IgG +: 88%).

And on May 17th, 2020 an alert is issued by the New York State Department of Health Identifying more than 100 cases of MIS-C associated to Covid 19 [7,8].

The clinical data was most often intense with fever for over 4 days, with constant vasoplegic shock. 55% of patients required the administration of vasoactive drugs, digestive signs are in the foreground (83%); we noticed also cardiac damage on echocardiography (69%), neurological signs: headaches, irritability, confusion and meningeal irritation.
An aseptic peritonitis.

by Toubiana:

almost constant and at the forefront in the MIS-C associated with Covid 19.

First signs and the state of shock is short (24 hours) as well as the in

immunosuppressed patients do not present an increased risk of devel

Fever, multi organ involvement, intense inflammatory syndrome, intes

as shown in Table 1.

19, thereby it would be recommending that while we have atypical pain

4. Conclusion

Covid 19?

mors 2, hematopoietic stem cell transplant recipients 1, aplastic anemia

port among 50 patients hospitalized in New York for Covid 19 disease,

management of the different disorders that appeared; the evolution was fatal

complicating the MIS-C syndrome and thus reinforcing the hypothesis of

intestinal ischemia and a positive screening test of Covid 19.

Our patient had some particularities; the length of time between the

Medullar aplasia with severe thrombocytopenia is an immunosup

Acute abdomen and the pseudo appendicular syndrome was reported

our case Algeria

Table 1

Clinical, imaging and laboratory features of differentes studies of syndrome MIS-C associated to covid 19.

| SERIES | Jones et al (USA) | Riphagen et al. (UK) | Verdoni et al. (Italy) | Toubiana et al. (France) | Total | our case Algeria |
|--------|------------------|----------------------|------------------------|--------------------------|-------|-----------------|
| Number of cases | 1 | 8 | 10 | 17 | 36 | 1 |
| Age | 0.5 | 8.4 | 7.5 | 7.5 | 7.5 | 9 ans |
| SEX/Female | 1 | 3 | 3 | 10 | 47% | 1 F |
| Obesity/overweight | - | 2 | - | 3 | 13.8% | overweight |
| Immuno depression | 0 | 0 | 0 | 0 | 0% | YES |
| Clinical features | | | | | | |
| FEVER > 4 day | 1 | 8 | 10 | - | 100% | <24H |
| Shock with inotropes treatment | 0 | 8 | 2 | 10 | 55% | NO |
| Gastrointestinal Symptoms | NO | 7 | 6 | 17 | 83% | YES |
| Neurological features | 1 | 2 | 4 | 16 | 61% | YES |
| Skin lesions | 1 | 4 | - | 13 | 69% | YES |
| Imagery abnormalities | Chest X-ray or CT abnormalities | 1 | 4 | 5 | 6 | 44% | YES |
| Echocardiography abnormal | 0 | 7 | 6 | 12 | 69% | - |
| Biological features | | | | | | |
| CRP moy (mg/l) | 133 | moy 303 (169-556) | moy 250 (90-525) | moy 219 (89-363) | 243 (89-556) | Yes (240-419) |
| Albumin moy (mg/l) | 28 | 22 | 32 | 20 | 24 | YES 20 |
| D-dimere moy (mg/l) | NO | 10.38 (3.4-24.5) | 3.798 | 4.76 (0.3-19.3) | 5.76 | YES 13 |
| GPK (IU/L) | - | 85 (16-247) | - | 85 | - | YES 7852 |
| Foscalcitoninng/ml | - | 30,55 | 23.3 (0.1-488) | 25.61 | - | |
| Fibrinogen | - | - | - | 6.21 (3139,24) | - | YES 5,48 |

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