Scholars Journal of Applied Medical Sciences
Abbreviated Key Title: Sch J App Med Sci
ISSN 2347-954X (Print) | ISSN 2320-6691 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Medicine

Management of Appendicular peritonitis at the Commune I Reference Health Center of Bamako

Diarra I[2*], Tounkara C[2], Dembélé Ks[3], Sanogo M[1], Dramé Bm[4], Kanthé D[8], Koné O[8], Keita B[1], Touré S[1], Coulibaly B[1], Kassogué S[1-5], Karembé B[6], Kanté L[7]

[1]Surgeon at the reference health center of commune 1 of Bamako
[2]Mother and Child Hospital 'Le Luxembourg'
[3]Tominian Reference Health Center
[4]Nianankoro Fomba Hospital of Ségou-Mali
[5]Bamako Laboratory of Clinical and Morphological Anatomy
[6]Reference Health Center in Commune 3 of Bamako
[7]Bamako Gabriel Touré University Hospital
[8]Markala Reference Health Center

DOI: 10.36347/sjams.2023.v11i09.013 | **Received:** 01.08.2023 | **Accepted:** 05.09.2023 | **Published:** 17.09.2023

***Corresponding author:** Diarra I
Surgeon at the reference health center of commune 1 of Bamako

Abstract **Original Research Article**

Aim: To determine the frequency of appendicular peritonitis in the department. To determine the diagnostic and therapeutic aspects. To analyze the results of management. ***Methodology***: This was a retrospective study conducted over a period of 05 years, from 01 January 2017 to 31 December 2021. ***Results*:** We collected 136 cases of acute generalised peritonitis, including 75 cases of appendicular peritonitis, i.e. 6.1% of surgical procedures. Males accounted for 73% of cases, with a sex ratio of 2.75 in favour of males. The mean age was 33.73 years, with a standard deviation of 12.22; the extremes ranged from 16 to 65 years. Abdominal pain was the most frequent reason for consultation, accounting for 97% of cases. In most cases, the diagnosis was made on clinical examination. Appendectomy, peritoneal cleansing and drainage were performed in all our patients. Post-operative management was straightforward in 87% of cases. ***Conclusion***: Appendicular peritonitis is one of the most common aetiological entities. It is diagnosed clinically and managed medico-surgically.

Key words: Appendicular Peritonitis, Therapeutic Diagnosis; Surgical Emergencies Csréf CI, Mali.

INTRODUCTION

Acute generalised peritonitis is an acute inflammation of the peritoneum. It is most often secondary to perforation of a digestive organ or to the spread of an intra-abdominal septic focus. [1]. Appendicular peritonitis is a complication of acute appendicitis, characterised by the spread of the infectious process to the peritoneal cavity.

It thus results in generalised or localised purulent peritonitis; it may appear immediately or follow the stage of appendicular abscess. [2]. Numerous studies of peritonitis caused by digestive perforation have shown that appendicular perforation predominates: 60.6% according to CAMARA B. and 84.3% according to KONATE E.B. [3, 4]

In the USA: FLUM D.R. *et al.*, [5] in 2001, in a retrospective study of 63707 appendectomies, found 25.85% of peritonitis due to appendicular perforation. In Europe: KRAEMER M [6], in 2003, in a multicentre prospective study of 519 cases of appendicitis in 11 surgical departments in Germany and Austria, noted 17.7% of peritonitis due to appendicular perforation.

In Africa: AZGAOU I. [7], in Morocco in 2011 in a retrospective study of acute peritonitis over 2 years at Mohamed VI University Hospital found 32.8% appendicular peritonitis. OUANGRÉ E. *et al.*, [8] in Burkina Faso in 2013 in a descriptive cross-sectional study of acute generalised peritonitis carried out 33% was of appendicular origin. In Mali: In 2018 CISSÉ A.H [9], in his study on acute peritonitis, found 50% appendicular perforations

The diagnosis of acute peritonitis is essentially clinical. Treatment is medical and surgical, combining resuscitation and antibiotic therapy. The severity and

prognosis depend on age, aetiology, delay in diagnosis, early treatment and the length of the operation. DIARRA M.O [10], found that delayed consultation was a factor in the mortality of appendicular peritonitis in a prospective descriptive study carried out at Sikasso hospital.

In view of the high frequency of this pathology in our department, we decided to carry out this study. The aim of our work was to study the specific features of appendicular peritonitis in the CSRéf of Commune I. To carry out this work, we set ourselves the following objectives: to determine the frequency of appendicular peritonitis in the general surgery department of the CSRéf of Commune I; to determine the clinical, para-clinical and therapeutic aspects; to analyse the results of management; and to determine the cost of management.

METHODOLOGY

This is a retrospective study. It took place over a period of 05 years, from 1 January 2017 to 31 December 2021, in the general surgery department of the reference health centre in Commune I of the Bamako district.

We included in this study all patients admitted, operated on and followed up in the department for appendicular peritonitis.

The media used were: patients' medical records, hospitalisation registers, registers recording operative reports, individual survey forms, outpatient consultation registers and the anaesthesia protocol.

The data were entered and analysed using SPSS version 25 software.

Word processing was carried out using WORD version 2021.

The parameters were compared using the Chi2 statistical test with P significant < 0.05.

RESULTS

During the study period, we performed 75 operations for appendicular peritonitis. This represents: 6480 surgical consultations, of which appendicular peritonitis accounted for 1.2%; 1040 hospitalisations, or 7.2% of cases of appendicular peritonitis; 1225 surgical procedures, or 6.1% of appendicular peritonitis;

Table I: Breakdown of patients by age group

Socio-demographic data		
Age range	Workforce	Percentage
16 - 30 years old	34	45
31 - 45 years old	27	36
> 45 years old	14	19
Total	75	100

The age group most represented was between 16 and 30, accounting for 45% of cases.

- The average age was 33.73 years.
- Standard deviation 12.22.
- The extremes were 16 and 65 years

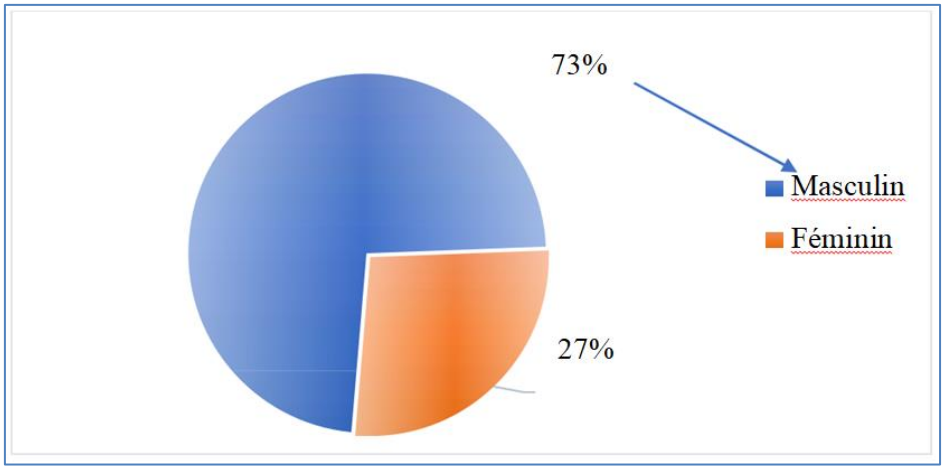


Figure 1: Distribution of patients by sex.

The sex ratio was 2.75 for men.

Table II Distribution of patients for consultation period

Consultation period	Frequency	Percentage
< 24h	35	47
24 - 72h	30	40
> 72h	10	13
Total	75	100
The consultation time was less than 24 hours in 47% of cases.		

Table III: Breakdown of patients by reason for consultation

Reason for consultation	Frequency	Percentage
Abdominal pain	72	96
Other	3	4
Total	75	100
Almost all patients (96%) had consulted a doctor for abdominal pain.		

Table IV: Distribution of patients by mode of onset.

Start mode	Frequency	Percentage
Progressive	41	55
Brutal	34	45
Total	75	100

The onset was abrupt in 45% of cases.

Table V: Distribution of patients according to the site of onset of pain.

Onset of pain	Frequency	Percentage
FID	46	61
Broadcast	18	24
Epigastric	8	11
Hypogastric	2	3
Periumbilical	1	1
Total	75	100

Pain was initially located in the right iliac fossa in 61% of cases and was diffuse in 24%. Physical examination

Table VI: Distribution of patients according to physical signs.

Physical signs	Frequency	Percentage
Pain on palpation	75/75	100
Localised defence	74/75	99
Contracture	58/75	77
Cry of the umbilicus	36/75	48
Douglas fir	9/75	12
Painful TR	56/75	75
Water content on Percussion	27/75	36
Tympany	11/75	15

Table VII: Distribution of patients according to ultrasound result.

Ultrasound results	Frequency	Percentage
Appendicular peritonitis	25	33,3
Acute appendicitis	16	21,3
Moderate fluid effusion in the		
peritoneal cavity	13	17,3
Acute peritonitis	10	13,3
Purulent effusion in the right iliac		
Fossa	8	10,7
Presence of a heterogeneous peri-		
appendicular collection	2	2,7
Sub-occlusive syndrome in		
Pelviperitonitis	1	1,3
Total	75	100

Ultrasound findings were consistent with appendicular peritonitis in 33.3% of cases, followed by acute appendicitis in 21.3%.

Table VIII: Distribution of patients according to intraoperative diagnosis.

Intraoperative diagnosis	Frequency	Percentage
Generalised appendicular peritonitis	62	83
Localised appendicular peritonitis	13	17
Total	75	100

Generalised appendicular peritonitis was found in 83% of cases.

Table IX: Distribution of patients according to type of anaesthesia.

Type of anaesthesia	Frequency	Percentage
AG+IOT	42	56
Mask AGM	23	31
ALR	10	13
Total	75	100

General anaesthesia with orotracheal intubation was used in 56% of cases.
Locoregional anaesthesia was used in some cases of localised appendicular peritonitis (13%).

Table X: Distribution of patients according to short-term (3 months) post-operative follow-up.

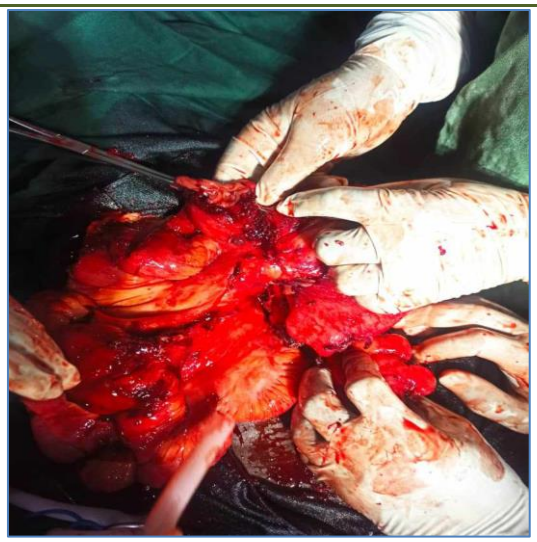
Short-term surgical follow-up	Frequency	Percentage
Simple	74	99
Deaths	1	1
Total	75	100

One (01) case of death by septic shock was observed (1.3%) among the 10 cases of parietal suppuration (13%).

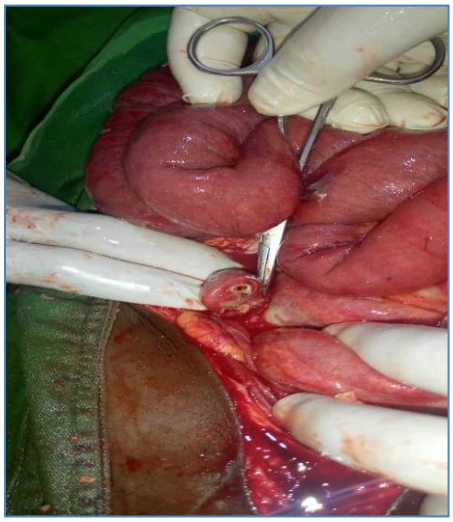
Treatment

All our patients benefited from preoperative filling, IV fluids, Placement of a urinary catheter, Antibiotic and analgesic therapy, A diet until transit resumes, Intraoperative drainage performed in all patients.

Surgical exploration phase



Discovery of the appendix



Appendix perforated at the top

Operating

specimens

DISCUSSION

We conducted a retrospective study over five (05) years from 1er January 2017 to 31 December 2021. It included 75 patients operated for appendicular peritonitis. Patients were identified on the basis of hospital records and reporting registers. In the course of our study, we were confronted with a number of difficulties, such as:

Poor archiving, Inadequate technical facilities, making it impossible to carry out certain emergency check-ups and others during on-call duty and on days when the center is not open. During our study, appendicular peritonitis accounted for 6.1% of surgical procedures and 55.15% of acute peritonitis at the CSRef in Commune I of the Bamako district.

This rate was comparable to a study conducted by MALLE O. [10] who found 52.5%. Studies conducted by YAOKREH J.B. (Ivory Coast, 2015) [11], and OUANGRÉ E. (Burkina Faso; 2013) [8], respectively found lower rates, notably 47.9% and 33%.

This drop in the rate compared with our study could be explained by the location and duration of the study. The mean age of our patients was 33.73 years, with extremes of 16 and 65 years. This average is: Higher than that of HAROUNA Y. in Niger [1- 12] who reported 26 years. Different from that of CAMARA B. in Mali [3], who found an average age of 22.5 years. Lower than that of MARIAGE M. in France [1- 13] who in his series found an average age of 39.8 years. This could be explained by the youth of the African population. Gender is not a risk factor for peritonitis; however, the male predominance observed in our study is in agreement with various authors: DIARRA M.O [11]. MARIAGE M. [23], and KONE A. [3].

Clinical Study

Despite advances in the management of appendicitis, the incidence of appendicular peritonitis remains high. It remains the main cause of acute peritonitis. In our series, appendicular peritonitis accounted for 55.15% of acute peritonitis. These results are comparable to those of MALLE O. in 2012 who reported 52.5%. [114]. Other authors have reported lower numbers:

- YAOKREH J.B. (Ivory Coast, 2015) [1[11]: 47,9%
- OUANGRÉ E. (Burkina Faso, 2013) [8]: 33%

A long delay in consultation is observed in African series [3; 10 and 15] an average of 5-6 days, compared with just 1 day in France [13]. The average consultation time in our study was 3 days, which is close to that of African authors (BAKHOU A. [9]. KONE A. [3]).

This delay remains longer than that observed in French series [16- 13].

This delay in consultation is linked to:

- Self-medication and traditional treatments are used as first-line treatment,
- Lack of financial resources and health insurance,
- Inadequate health cover.
- The organisation of the national health system

Clinical Signs

Chemical and/or septic attack on the peritoneum, in peritonitis, leads to profound changes, both peritoneal and systemic, with local and general repercussions, which are at the origin of the following signs [17].

Abrupt, spontaneous abdominal pain was the main symptom in almost all cases (97%). It remains the dominant functional sign according to several authors: BAKHOU A. [1[15] Morocco (2012), DIARRA M.O [10]. Mali 2018 and JHOBTA R.S. [18], India 2006. This result is consistent with the literature.

In our study, this pain was accompanied by nausea and vomiting in 60% of patients. Nausea and vomiting are the expression of paralytic ileus in generalised forms and are partly responsible for fluid loss leading to dehydration and electrolyte disorders. [19]. The diagnosis of peritonitis is primarily clinical.

Abdominal pain on palpation with tenderness is the most important physical sign. [16] If examined early, it may be localised or limited to simple generalised tenderness [20], which has the same semiological significance [16]. It was noted in all our patients. This rate varies between 20.8% and 89% according to the authors [21- 25].

This difference could be linked to the delay in consultation and the inadequacy of technical facilities in Africa. Pain in the douglas is of diagnostic interest in peritoneal syndrome and indicates peritoneal irritation. It was noted in 75% of our patients. This rate is lower than that of DIARRA MO 100%. [3], but higher than that of BAKHOU A. [15], which was 47%. This difference could be related to the stage of progression of the disease. These parietal signs were the main clinical arguments for differentiating between appendicular peritonitis and appendicitis.

Additional Tests

It was requested in all our patients, compared with 90.3% in the study by DIARRA M.O. [10] and 40.5% in the series by MARIAGE M [13]. This difference may be due to the accessibility and availability of CT scans in developed countries. The study showed that:

- Localised or diffuse peritoneal effusion in 30.7% of patients
- And/or an appendicular lesion in 41 (54.6%) of our patients.

Treatment

Treatment of appendicular peritonitis includes surgery, antibiotic therapy and resuscitation [16]. In our series, all our patients received resuscitation. This resuscitation was brief preoperatively (a few hours before laparotomy) and continued postoperatively. It was coupled with the insertion of a urinary catheter to assess the fluid balance (in and out).

In our series, 61.3% of patients received antibiotic therapy for 7 to 15 days. This antibiotic therapy was intravenous perioperatively [2- 26]. In fact, this antibiotic therapy must be administered parenterally for the first few days in order to obtain an effective peritoneal concentration, and then followed up per os (once transit has resumed).

There is still disagreement about the duration of antibiotic treatment [27]. Any local or generalised infection in digestive surgery should be treated with antibiotics for 7 days or more, depending on the course of the infection. [28].

In our context, laparoscopy was not available, and the preferred approach was median laparotomy, which offers total comfort for performing the appendectomy and above all allows effective aspiration of all the pus and complete washing of the small intestine and mesenteric layers, as well as the diaphragmatic cupolas, flanks and douglas. It was used in 84% of our patients and in 16% by extended McBurney incision.

These Results Do Not Differ from the African Series:

- In Morocco BAKHOU A. [1[15] found 96.5% median laparotomy versus 3.5% McBurney point incision.

In Mali: DIARRA M.O. [10] reported 77.4% median laparotomy and 22.6% extended Mc Burney incision.

In Europe, on the other hand, the laparoscopic approach has been the subject of several studies concluding that laparoscopic management of complicated appendicitis was possible and safe, and that recourse to laparotomy was only necessary in the event of failure.

In France in the series MARIAGE M. [13]96.6% of patients underwent laparoscopic surgery.

It Would Result in a Reduction Of:

- Post-operative pain,
- Length of hospital stay,
- Adhesions and occlusions on flanges.

The additional cost of the equipment used is one of the main drawbacks. [29].

The IDF was the main site of appendicitis in our patients (85% of cases), as attested by the general literature and studies carried out in Mali [3], in France [1- 13], and in Niger [12]. We report 11 cases of mesoceliac appendix (17%). In relation to the cecum, the

appendix was latero-caecal in 68% of patients and 17% retro-caecal.

Appendectomy remains the ideal solution for appendicular perforation, and we and other authors have performed it in all our patients [16- 30], this appendectomy was associated with peritoneal cleansing and systematic drainage (parietocolic and douglas gutters were the preferred areas). For some European authors [16- 30], this drainage is questionable, which is understandable because the quantity of liquid required for washing is sufficient (10-12 L), but we do not have this method.

The morbidity rate of 13.33% did not differ statistically from those of the African authors. In our series, postoperative morbidity was marked by complications such as parietal suppuration in (13.33%). None of our patients underwent repeat surgery.

Mortality in Acute Peritonitis

Varies according to the aetiology. In African series [8- 11] and our own, the mortality rate for appendicular peritonitis varies between 1% and 17%, compared with 1.1 in France [1- 13]. The European literature estimates this mortality at < 10%. [16], in our series we had one (1) death (1.3%) due to septic shock.

The prognostic factors reported (delay in consultation linked to certain traditional practices, modest diagnostic and therapeutic resources) and the causes of death in African series are (septic and hypovolaemic shock, digestive fistula, poly visceral failure). [8- 31]

The mortality rate for out-of-hospital peritonitis varies from 0 to over 40% depending on the aetiology, the population studied and the initial clinical severity [32- 34]. Peritonitis of appendicular origin appears to have a better prognosis [35].

CONCLUSION

Appendicular peritonitis is one of the most common aetiological entities. It is characterised by a delay in consultation. Diagnosis is mainly clinical and management is medical and surgical. Despite its good prognosis, mortality and morbidity are not negligible in developing countries. Improved technical facilities, adequate health coverage and health education could reduce the mortality and morbidity rate.

CONFLICT OF INTEREST: None

REFERENCES

1. Proske, J.M., Franco, D**.** (2005). Acute peritonitis; Revue Prat (Paris), 55, 2167-2172.
2. Constantin, C. L. Urgences chirurgicales - péritonite. Internat Mémoire, 2nd ed Vernazobres - Gregor, Paris: n° 275: p109.
3. Camara, B. (2008). Peritonitis due to appendicular perforation in the general and paediatric surgery department of Gabriel Touré Hospital. *Thèse Med Bamako*, n°08.p80
4. Cissé, B. (2003). Les perforations digestives dans les services de chirurgie générale et pédiatrique du CHU Gabriel Touré. *This med Bamako*, (54).
5. Flun, D. R. (2001). Has is diagnosis of appendicitis decreased over time. *A population–based analysis JMA*, *286*, 742.
6. Kraemer, M., Kraemer, K., Leppert, R**.** (1999). Perforating appendicitis: is it a separate disease? Acute abdominal pain study group. *Eur J Surg 165*(5). 473-80.
7. Azgaou, I. (2011). Profil épidémiologique, clinique et thérapeutique des péritonites aiguës : Etude rétrospective sur 2 ans au CHU Mohamed VI de Marrakech. *Th Méd Marrakech*, n°120 (11), p129.
8. Ouangre, E., Zida, M., Bonkoungou, P. G., Sanou, A., Traore, S. S**.** (2013). Les péritonites aigües généralisées en milieu rural au Burkina Faso : À-propos de 221 cas. Rev. *CAMES SANTE, 1*(2), 5.
9. Cissé, A. H. (2019). *Péritonites aiguës au CS Réf de la commune I: Aspects épidémiologique, clinique et thérapeutique* (Doctoral dissertation, USTTB).
10. Diarra, M. O**.** (2018). Prise en charge des péritonites appendiculaires à l'hôpital de Sikasso. *Th méd Bamako*, n°18M71, p91.
11. Yaokreh, J. B., Coulibaly, O., Kouamé, D. B., Et Al. (2015). Descriptive study of peritonitis in children at Yopougon University Hospital. *Rev. int. sc. méd. 17*,4, 173-177.
12. Harouna, Y. D., Abdou, I., Saidou, B., & Bazira, L. (2005). Les péritonites appendiculaires généralisées à propos de 70 cas à l'hôpital national de Niamey. *Communication scientifique ACAF, Bamako*.
13. Mariage, M. (2016). Stercoral peritonitis of appendicular origin: a rare and serious form of acute appendicitis. *Thèse méd. Amiens*, n°174.
14. Mallé, O. A. (2015). Peritonitis at the CSREF of the commune I of Bamako: Epidemiological, clinical and therapeutic aspects. *Thesis med Bamako*, n °145.
15. Bakhou, A**.** (2012). Appendicular peritonitis in children. Experience of the general paediatric surgery department of CHU Marrakech. *Th méd Marrakech*, n° 25.
16. Faniez, P. L., Serpeau, T. C**.** (1982). Acute peritonitis. *Encycl Med Chir Estomac-Intestin*, 9045 A10, 6.
17. Maïga, B. (1975). Contribution à l'étude des appendicites aigues: Aspect clinique, anatomopathologique, et étiologique. *Th Med Bamako*.
18. J Hobta, R. S., Attri, A. K., & Kaushik, R**.** (2006). Spectrum of perforation peritonitis in India-review

of 504 consecutive cases. *World J of emergency surg*, *1*, 26.
19. Poilleux, F., Et Al. (1979). Sémiologie chirurgicale : Sémiologie du péritoine (Rappels généraux anatomiques et physiopathologiques). Paris: Flammarion-Médecine et sciences, Tome II (Appareil digestif), 4th Ed, 971.
20. Mallick, S., & Klein, J. F. (2001). Management of typhoid perforation of the small bowel: a case series in Western French Guiana. *Medecine Tropicale: Revue du Corps de Sante Colonial*, *61*(6), 491-494.
21. Dembelé, B. (2005). Les péritonites aiguës généralisées dans les services de chirurgie générale et pédiatrique du CHU Gabriel Touré de Bamako à propos de 200 cas. *Thesis med Bamako*, n°215.
22. Kunin, N., Bansard, J. Y., Letoquart, J. P., Chareton, B., Lebois, E., La Gamma, A., & Mambrini, A. (1991). Prognostic factors for peritonitis in elderly patients. Multifactorial statistical analysis apropos of 216 cases. *Journal de Chirurgie*, *128*(11), 481-486.
23. Adesunkanmi, A**.** (2003). Acute generalised peritonitis in African children: Assessment of severity of illness using modified APACHE II Score. *J surg*, *73* (5), 275-9.
24. Cougard, P., Barrat, C. (2000). Laparoscopic treatment of perforated duodenal ulcer. Results of a multicentre retrospective study. *Ann Chir*, *125*, 726-31.
25. Sakhri, J**.** (2000). Treatment of perforated duodenal ulcers. *Tunisie Médicale*, *78*, N°08-09.
26. Podevin, G., M, B. M., D, L. Y**.** (2013). Appendicitis and apppendicular peritonitis in children 2005. *EMC-Pédiatrie-maladies infectieuses*, *(4)*, 1-6 [Article 4-018-Y-10].
27. Lund, D. P., & Murphy, E. U. (1994). Management of perforated appendicitis in children: a decade of aggressive treatment. *Journal of pediatric surgery*, *29*(8), 1130-1134.
28. French Society of Anaesthesia and Intensive Care. Prise en charge des péritonites communautaires. Consensus conference of 16 June 2000. Hôpital d'instruction des armées de Begin (94). Short text: 11p.
29. Partrick, D. A. (2006). Prospective evaluation of a primary laparoscopic approach for children presenting with simple or complicated appendicitis. *The American journal of surgery*, *192*(6), 750-755.
30. Flamant, Y**.** (1994). Complications of acute appendicitis. *Rev Prat (paris)*, *44*, 2231-35.
31. Dissa, B. A. (2012). Les péritonites aiguës aspects cliniques, diagnostiques et thérapeutiques à l'hôpital FOUSSEYNI DAOU de Kayes. *Thèse méd. Bamako*, n°53.
32. Riché, F. C., Dray, X., Laisné, M. J., Matéo, J., Raskine, L., Pors, S. L., ... & Cholley, B. P. (2009). Factors associated with septic shock and mortality in generalized peritonitis: comparison between community-acquired and postoperative peritonitis. *Critical Care*, *13*(3), 1-9.
33. Montravers, P., Lepape, A., Dubreuil, L., Gauzit, R., Pean, Y., Benchimol, D., & Dupont, H. (2009). Clinical and microbiological profiles of community-acquired and nosocomial intra-abdominal infections: results of the French prospective, observational EBIIA study. *Journal of Antimicrobial Chemotherapy*, *63*(4), 785-794.
34. Cattan, P., Yin, D., Sarfati, E., Lyu, R., De Zelicourt, M., & Fagnani, F. (2002). Cost of care for inpatients with community-acquired intra-abdominal infections. *European Journal of Clinical Microbiology and Infectious Diseases*, *21*, 787-793.
35. Gauzit, R., Péan, Y., Barth, X., Mistretta, F., Lalaude, O., & Top Study Team. (2009). Epidemiology, management, and prognosis of secondary non-postoperative peritonitis: a French prospective observational multicenter study. *Surgical infections*, *10*(2), 119-127.