

Management of uncomplicated acute appendicitis in children: a review of evidence published in 2017/2018

Manuseio de apendicite aguda não complicada em crianças: revisão da evidência publicada em 2017-2018

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ABSTRACT

Purpose: To review the existing evidence in 2017-2018 and spreading the information, with solid scientific basis, regarding the use of no operative treatment for children with uncomplicated acute appendicitis. **Methods:** A literature search for the years 2017/2018 was performed using the following descriptors: uncomplicated acute appendicitis, children, paediatric appendicitis, pediatric appendicitis, management, medical treatment, clinical treatment, antibiotics treatment, no operative treatment and surgical treatment, appendectomy. Randomized controlled trials were considered the best source of information. **Results:** On the reviewed literature, one can say that the no operative approach for uncomplicated acute appendicitis in children presents similar outcome, hospital length of stay, antibiotic days, reduced degree and duration of pain, and overall perioperative complication rates, but there may be more inpatient readmissions and missing other diseases when compared with surgical treatment. However, this new approach reduces negative appendectomy rate, shorter days of sick leave and care leave, expedited return for the child go back to school and other normal activities, decreased hospital charge and less long term complications. **Conclusion:** Antibiotics treatment alone appears to be a safe first-line therapy in selected children with uncomplicated acute appendicitis and deserves a randomized controlled trial in tertiary hospitals in Brazil. Those patients who require future appendectomy do not experience significant complications. A multicenter Brazilian trial comparing antibiotics-first to appendectomy, including outpatient management, is feasible to evaluate efficacy and safety of this new approach.

Keywords: Uncomplicated acute appendicitis. Children. Medical treatment. Antibiotics treatment. Appendectomy.

RESUMO

Objetivo: Revisar a evidência existente em 2017-2018 e divulgar informações, com base científica sólida, no que se refere ao tratamento clínico para crianças com apendicite aguda sem complicações. **Métodos:** Foi realizada pesquisa de literatura para os anos 2017/2018 utilizando os seguintes descritores: apendicite aguda sem complicações, crianças, apendicite pediátrica, tratamento, tratamento médico, tratamento clínico, tratamento com antibiótico, tratamento não cirúrgico e tratamento cirúrgico, apendicectomia. Os ensaios controlados randomizados constituíram a melhor fonte de informação. **Resultados:** Na literatura revisada, pode-se dizer que a abordagem clínica para a apendicite aguda sem complicações em crianças apresenta resultados semelhantes quanto a permanência hospitalar, dias de antibioticoterapia, menor intensidade e duração da dor e taxas de complicações primárias perioperatórias, podendo haver mais readmissões para pacientes internados e outras doenças concomitantes quando comparadas com o tratamento cirúrgico. No entanto, esta nova abordagem (tratamento clínico) reduz a taxa de apendicectomia negativa, abrevia o tempo de licença por doença e cuidados médicos, promove o retorno mais breve da criança à escola e outras atividades normais, diminui o custo hospitalar e complicações à longo prazo. **Conclusão:** O tratamento com antibióticos isoladamente parece ser terapia segura de primeira linha em crianças selecionadas com apendicite aguda sem complicações e merece estudo randomizado controlado em hospitais terciários no Brasil. Aqueles pacientes que necessitarem de apendicectomia no futuro não apresentarão complicações significativas. Estudo multicêntrico brasileiro que compare o tratamento inicial com antibióticos versus apendicectomia, incluindo abordagem ao nível ambulatorial, deverá ser realizado para avaliar a eficácia e a segurança desta nova abordagem.

Palavras-chave: Apendicite aguda não complicada. Criança. Tratamento médico. Tratamento com antibióticos. Apendicectomia.

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INTRODUCTION

The success rate of no operative treatment of appendicitis is gaining evidence in the last decade of the XXI century. Its success rate is estimated above 85% of the cases. The length of hospital stay is similar when compared to surgical treatment. Complications related to these different approaches tend to be smaller in the patients who underwent medical treatment, cost-effectiveness seems to support the clinical approach, and however the estimated recurrence of appendicitis occurs in approximately 4 to 20% of these patients at the long term follow-up. The overall nonoperative treatment failure including both early failure and recurrence occurred more frequently among those with appendicoliths than without appendicoliths and those with misdiagnosis of uncomplicated appendicitis. Normal appendix can be present in approximately 15% of children who undergo surgery. Patient satisfaction levels were marginally in favor of operative treatment¹⁵. Taking into account only children with perforated appendicitis early appendectomy is better cost-effectiveness¹⁶.

Nowadays, overall the surgical laparoscopic appendectomy treatment remains the preferable choice for the pediatric surgeons^{17,18}. Since this procedure can be done safely, in adults, even as an outpatient basis it became more attractive for the pediatric surgeons to perform surgical treatment instead of looking for evidence that seems to be as hypothetical way of medical treatment in tertiary hospital located in developed countries¹⁸⁻²⁰.

Although the evidence, so far, allows a research protocol for a randomized controlled trial, already done in some countries^{7,18,19}, the pediatric surgeons in Brazil are very reluctant in assuming the challenging of obtaining evidence for, at least in selected patients, proposing to parents the antibiotics treatment for children with uncomplicated acute appendicitis. The selection for the antibiotics protocol and also a critical analysis of cost benefits can be barriers for the change in the traditional paradigm²¹. Thus, the purpose of this study is to review the existing evidence in 2017-2018 and spreading this information with solid scientific basis regarding the use of no operative treatment for children with this condition.

METHODS

A literature search for the years 2017/2018 was performed using the following descriptors: uncomplicated acute appendicitis, children, pediatric appendicitis, pediatric appendicitis, management, medical treatment, clinical treatment, antibiotics treatment, no operative treatment, surgical treatment, appendectomy. Eligible for inclusion were both and randomized controlled trials and cohort studies

including children in which the outcome of no operative treatment of uncomplicated appendicitis was reported with a minimum follow-up period of one year. Two authors extracted data independently and assessed quality. Primary outcome parameter was the percentage of children experiencing complications after treatment. Secondary outcomes were early failures, recurrent appendicitis and appendectomies, length of hospital stay for all indications and on request. The null hypothesis was that clinical outcomes, length of hospital stay and hospital readmission rates would be unchanged after clinical and surgical treatments.

RESULTS

Twenty-two papers were selected for this review. Regarding the perioperative outcome, survival and major complications are similar using surgical and non-operative approaches. When length of hospital stay is analyzed, one can see that comparing surgical treatment with antibiotics alone, this secondary outcome has been longer in the antibiotic treatment; however, it has been predefined in the protocols for the monitoring of children in this group to ensure patient safety in the trials. Because none of the children initially treated with antibiotics and later having appendectomy had major complications, the length of hospital stay related to antibiotic therapy may possibly be shortened in practice. One drawback of antibiotic treatment for acute appendicitis is the possible bias due to spontaneously resolving appendicitis in children.

Decreased hospital charges have been shown for children with uncomplicated acute appendicitis who received antibiotics alone¹⁹.

It needs to be emphasized that safety and feasibility of the same-day discharge for uncomplicated appendicitis can be achieved using laparoscopy with the potential to yield significant healthcare cost savings²¹.

DISCUSSION

An increasing amount of evidence supports the use of antibiotics instead of surgery for treating children with uncomplicated acute appendicitis. Although the literature reviewed was not able to demonstrate the no inferiority of antibiotic treatment relative to appendectomy for appendicitis in children it supports the evidence that overall approximately 75% of children with uncomplicated acute appendicitis can be successfully treated with antibiotic therapy alone. Additionally, the long term side effects of this new approach are significantly lower than the traditional surgical treatment. On the hand, the presence of Intraluminal appendicoliths can predict failed no operative management for appendicitis and the development of complicated acute appendicitis in children, as well as in adults.

Routine use of good clinical grounds, adequate laboratory and ultrasound image investigation in children with suspected acute appendicitis can improve patient care by reducing unnecessary surgery, resulting in more efficient use of hospital resources. These accomplishments are very important in developing countries like Brazil.

To succeed, the antibiotic treatment alone must provide broad-spectrum coverage for all the pathogens that might cause appendicitis. To avoid this limitation, the use of ertapenem, or ceftriaxone plus metronidazole, or ertapenem and/or cefoxitin, for examples, provide broad-spectrum coverage and only requires a single, daily dose could be effective in treating serious intraabdominal infections, including appendicitis²⁰. Future studies of antibiotic treatment for appendicitis should seek efficacy while using antibiotics with a more restricted antibacterial spectrum. For the moment, ceftriaxone plus metronidazole is a streamlined, cost-effective regimen in the treatment of no perforated, perforated, and abscessed appendicitis in children.

Some could guess that relapses could happen during whole life, which imply early surgical procedure, avoiding further potential complications and inappropriate expenses. We hypothesized that a majority of children treated with only antibiotics would not present another episode during the following years.

Data interpretation is very important when doing this kind of review. For instance, the ultimate end point as appendicitis at 1 year recurrence rate for antibiotics treatment can be observed as high as 22.6%, which is compelling. In addition, the issue of risk of missing other pathologies in this group is in an important issue¹⁵.

As a general observation, on the reviewed literature, one can say that the no operative approach for uncomplicated acute appendicitis in children presents similar outcome, hospital length of stay, antibiotic days, reduced degree and duration of pain, and overall perioperative complication rates, but there may be more inpatient readmissions and missing other diseases; on the other hand, reduced negative appendectomy rate, shorter days of sick leave, care leave, expedited return to school and other normal activities, decreased hospital charge and less long term complications⁸. Double-blind controlled randomized trials are needed to differentiate these effects²².

If one asks the surgical resident trainee what is the best option for treating uncomplicated acute appendicitis children, there will be no doubt that the right answer is surgical treatment plus perioperative antibiotics¹¹. This answer is equally true for the great majority of pediatric surgeons in Brazil.

This review is an addition to the literature on the important issue of conservative versus surgical management of uncomplicated appendicitis in children. The article highlights the necessity for unbiased interpretations of data and the importance of utilizing data appropriately.

Finally, it is up to the pediatric surgeon decides based on evidence, clinical grounds and environment the optimal care for the specific child who suffers from uncomplicated acute appendicitis, having in mind do no harm and do the good, and also "shared decision making between surgeon and patient"¹⁴.

CONCLUSION

Antibiotics treatment alone appears to be a safe first-line therapy in selected children with uncomplicated acute appendicitis and deserves a randomized controlled trial in tertiary hospitals in Brazil. Those patients who require future appendectomy do not experience significant complications. A multicenter Brazilian trial comparing antibiotics-first to appendectomy, including outpatient management, is feasible to evaluate efficacy and safety of this new approach.

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