SOCRATES

SOCRATES Episode II (synopsis of Cochrane reviews applicable to emergency services Episode II): the return of Series III

P Gilligan, A Pountney, B Wilson, C Mehigan, E Kidney, P Jennings, J Cooper, D Hegarty, J Lee, A Khan, G Lumsden, D Godden, M Shepherd, L Allonby-Neve, A Broderick, S Carr, S Wilson, J O'Sullivan

To study the phenomenon of disease without books is to sail an uncharted sea, while to study books without patients is not to go to sea at all. Sir William Osler (1849–1919)

In this article, the SOCRATES group summarises 12 reviews from the *Cochrane Database of Systematic Reviews* produced by the Renal Group that we felt were of particular relevance to our colleagues in emergency medicine.

METHODS

The method used to find and summarise the 12 reviews relating to renal medicine and urology is as described previously.

NON-STEROIDAL ANTI-INFLAMMATORY DRUGS VERSUS OPIOIDS FOR ACUTE RENAL COLIC

Renal colic is a very painful and distressing condition. Most renal calculi pass spontaneously. Relief of pain is one of the integral parts of the management of this condition. The use of both non-steroidal anti-inflammatory drugs (NSAIDs) and opioids has been recommended.

Results

The reviewers found 20 trials with 1613 participants. There was a marked heterogeneity between the studies, and as a result all the groups were not pooled. In all, 10 of 13 groups showed reduced incidence of use of rescue medication and reduced side effects with NSAIDs. NSAIDs did not reduce the use of opioid but did reduce pain scores. NSAIDs may have fewer side effects than pethidine. There were more side effects with opioids.

SOCRATES says

Both opioids and NSAIDs can be used in the treatment of renal colic, but opioids are associated with more adverse effects.

Holdgate A, Pollock T. Nonsteroidal anti-inflammatory drugs (NSAIDs) versus opioids for acute renal colic (Cochrane Review) Cochrane library. *Cochrane Database Syst Rev* 2006;(4); CD004137.

FLUIDS AND DIURETICS FOR ACUTE URETERIC COLIC

Fluids and diuretics have been used to increase renal flow in the hope of enabling the patient to

Emerg Med J 2007;24:489–491. doi: 10.1136/emj.2006.043679 pass calculi more quickly. Evidence to support this treatment regimen was examined.

Results

The reviewers identified one trial with 60 participants. This study compared 3 l of intravenous fluid with no intravenous fluid over 6 h. No diuretics were given. There was no difference in pain scores or in the need for surgical intervention between the two groups.

SOCRATES says

There is no evidence that giving intravenous fluids and/or diuretics to patients with renal colic is beneficial for accelerating the passage of calculi.

Worster A, Richards C. Fluids and diuretics for acute ureteric colic. *Cochrane Database Syst Rev* 2006;(4); CD004926.

WATER FOR PREVENTING URINARY CALCULI

Urinary calculi are a common condition and are recurrent. Patients may be seen in the emergency department with this condition, and should be given advice regarding the condition and also informed how to minimise the risk of recurrence. This review intended to assess the effectiveness of high water intake in reducing the risk of recurrence.

Results

One relevant trial was identified, with 199 patients. This showed that the recurrence rate was significantly lower in the increased water intake group (12% vs 27%, $p = 0.008$, relative risk (RR) = 0.45, 95% CI 0.24 to 0.84), and the mean (SD) time for recurrence was significantly higher, 3.23 (1.1) years, in the increased water intake group as compared with 2.09 (1.37) years in the no intervention group ($p = 0.016$, weighted mean difference = 1.14, 95% CI 0.33 to 1.95).

SOCRATES says

There is only limited evidence, but the one available study shows that increased water intake reduces the risk of recurrence and prolongs the recurrence interval.

Abbreviations: NSAID, non-steroidal anti-inflammatory drug; RUTI, recurrent urinary tract infection; UTI, urinary tract infection

See end of article for authors' affiliations

Correspondence to: Dr P Gilligan, Beaumont Hospital, Beaumont Road, Dublin D9, Ireland; peardargilligan@beaumont.ie

Accepted 12 December 2006

Qiang W, Ke Z. Water for preventing urinary calculi. *Cochrane Database Syst Rev* 2006;(4):CD004292.

ANTIBIOTIC DURATION FOR TREATING UNCOMPLICATED, SYMPTOMS OF LOWER URINARY TRACT INFECTIONS IN OLDER WOMEN

Urinary tract infection (UTI) is common, particularly among the older female population. This review aimed to determine the optimum length of antibiotic treatment for female patients aged over 60 years with a UTI.

Results

The reviewers identified 13 trials involving 1435 older females. Six of these compared single-dose with short-course treatment, three compared single-dose with long-course treatment and four compared short with long-course treatment. Resolution of short-term bacteriuria was better in the longer course treatment group as compared with the shorter term treatment group. However, there was no difference in long-term bacteriuria or clinical cure rate. One study found that patients prefer single-dose treatment. The authors comment that numbers of studies and sample sizes were low.

SOCRATES says

There is no strong evidence to suggest what the optimum treatment length should be. Further work is needed in this area.

Lutters M, Vogt-Ferrier NB. Antibiotic duration for treating uncomplicated, symptomatic lower urinary tract infections in elderly women. *Cochrane Database Syst Rev* 2006;(4); CD 001535.

DURATION OF ANTIBACTERIAL TREATMENT FOR UNCOMPLICATED UTI IN WOMEN

Urinary tract infection in young women is a frequent presentation to the emergency department. There is uncertainty regarding the optimum length of antibiotic treatment for this condition. This review aims to compare 3-day antibiotic treatment with a longer (≥ 5 days) treatment.

Results

The reviewers included 32 trials (9605 patients). There was no difference in outcome regarding symptoms between 3-day and 5–10-day antibiotic regimens. However, the longer regimen was significantly more effective at eradicating bacteriuria (RR 1.31, 95% CI 1.08 to 1.60, $p = 0.006$). Adverse effects were significantly more common in the longer regimen (RR 0.83, 95% CI 0.74 to 0.93, $p = 0.001$).

SOCRATES says

Three days of antibiotics is as effective as longer courses at achieving symptomatic relief, but if eradication of bacteriuria is necessary, then a longer course should be prescribed.

Milo G, Katchman EA, Paul M, Christiaens T, Baerheim A, Leibovici L. Duration of antibacterial treatment for uncomplicated urinary tract infection in women. *Cochrane Database Syst Rev* 2006;(4); CD 004682.

SHORT VERSUS STANDARD DURATION ORAL ANTIBIOTIC TREATMENT FOR ACUTE URINARY TRACT INFECTION IN CHILDREN

Acute urinary tract infection in children is a relatively common condition, but uncertainty surrounds the optimum length of antibiotic treatment. This review intended to assess the benefits and harm of short-course (2–4 days) versus longer course (7–10 days) treatment.

Results

Ten trials were identified (652 children). There was no significant difference in positive urine cultures at 0–10 days, or at 1–15 months after treatment. There was no significant difference in the development of resistant organisms between the different regimens.

SOCRATES says

A short (2–4-day) course of antibiotics is as effective as longer courses for UTIs in children.

Michael M, Hodson EM, Craig JC, Martin S, Moyer VA. Short versus standard duration oral antibiotic therapy for acute urinary tract infection in children. *Cochrane Database Syst Rev* 2006;(4); CD 003966.

LONG-TERM ANTIBIOTICS FOR PREVENTING RECURRENT URINARY TRACT INFECTION IN CHILDREN

Children with recurrent UTIs are at risk of pyelonephritis and systemic illness. Long-term antibiotics have been given to children with UTIs to prevent recurrence, but they are not without risk of side effects.

Results

The reviewers identified 8 studies ($n = 618$). There was a significant reduction in the risk of UTI in all groups. The duration of treatment varied from 10 weeks to 12 months. One study found that nitrofurantoin was more effective than trimethoprim, but that it was associated with more side effects.

SOCRATES says

The review found that there is evidence that long-term antibiotics do prevent some infections, but further research is required.

Williams GJ, Wei L, Lee A, Craig JC. Long-term antibiotics for preventing recurrent urinary tract infection in children. *Cochrane Database Syst Rev* 2006;(4); CD 001534.

ANTIBIOTICS FOR PREVENTING RECURRENT URINARY TRACT INFECTIONS IN NON-PREGNANT WOMEN

Recurrent urinary tract infections (RUTIs) are associated with significant discomfort, and have a high impact on emergency departments and general practice. The efficacy and safety of prophylactic antibiotics for uncomplicated RUTI is unclear.

Results

The reviewers identified 19 studies ($n = 1120$). 10 trials compared antibiotics with placebo and found that antibiotics were superior (number needed to treat = 1.85). Antibiotics were associated with more side effects (RR = 1.78). Eight trials compared the type and duration of antibiotics. The most effective antibiotic was related to community-resistant patterns. One trial studied UTIs associated with intercourse and found that post-coital treatment is as effective as daily intake.

SOCRATES says

Prophylactic antibiotics reduce the rate of RUTI in non-pregnant women with uncomplicated RUTIs. The effect is only as long as the treatment and side effects are common.

Albert X, Huertas I, Periero I, Sanifelix J, Gosalbes V, Perrota C. Antibiotics for preventing recurrent urinary tract infections in non-pregnant women. *Cochrane Database Syst Rev* 2006;(4); CD 001209.

ANTIBIOTICS FOR ACUTE PYELONEPHRITIS IN CHILDREN

Acute bacterial UTI is common in infants and may lead to acute pyelonephritis. Pyelonephritis has a significant morbidity and

may result in permanent renal failure. The type, route and duration of antibiotics require elucidation.

Results

The reviewers identified 18 trials including 2612 patients aged from 0 to 18 years. There is no significant difference in cefixime as an oral or intravenous agent in terms of fever and renal damage at 6 months. Cefixime intravenous for 3–4 days followed by oral administration was similar to oral cefixime for 14 days. There was no significant difference between single and thrice daily doses of aminoglycosides.

SOCRATES says

Children with acute pyelonephritis can be effectively treated with oral cefixime (14 days), or intravenous cefixime (2–4 days) followed by oral cefixime. If an aminoglycoside is chosen for treatment, it can be given as a single daily dose.

Bloomfield P, Hodson EM, Craig JC. Antibiotics for acute pyelonephritis in children. *Cochrane Database Syst Rev* 2006;(4); CD 003772.

EMERGENCY INTERVENTIONS FOR HYPERKALAEMIA

Hyperkalaemia is a life-threatening condition that requires prompt treatment. As such, treatment is the responsibility of the emergency physicians, who must be familiar and confident with treatment options. Treatment is aimed at stabilising cell membrane potentials (intravenous calcium), increasing potassium uptake into cells (insulin, bicarbonate, β agonists) and increasing excretion of potassium (resins, dialysis). The aim of this review was to review the evidence regarding the interventions for hyperkalaemia.

Results

Twelve studies involving 163 patients, including those in end-stage renal failure, were reviewed. On the basis of small studies, inhaled or nebulised β agonists, and intravenous glucose and insulin were effective in the treatment of hyperkalaemia. A combination of nebulised β agonist with intravenous glucose and insulin was more effective than the two treatments in isolation. Dialysis is an effective intervention. In the authors' conclusion, they comment on a wealth of anecdotal and animal data on the value of intravenous calcium for treating arrhythmias in the context of hyperkalaemia.

SOCRATES says

The standard treatment options of nebulised β agonist, and intravenous glucose and insulin appear to be effective, particularly in combination.

Mahoney BA, Smith WAD, Lo DS, Tsoi K, Tonelli M, Clase CM. Emergency interventions for hyperkalaemia. *Cochrane Database Syst Rev* 2006;(4); CD 003235.

CRANBERRIES FOR PREVENTING URINARY TRACT INFECTIONS

Patients who are diagnosed with a UTI in the emergency department may seek advice about what to do to prevent its recurrence. A proportion of patients will present with recurrent UTIs, and the advice they are given should include how to limit recurrent infections. Cranberry juice has been demonstrated to

prevent bacteria adhering to bladder epithelium, and may have a role in preventing UTI. This review aimed to assess the effectiveness of cranberries in preventing recurrent UTIs.

Results

Seven trials involving 604 patients with recurrent UTIs or those who were regarded as being at high risk of developing UTIs (older patients, catheterised, pregnant, urinary tract abnormalities) were identified. There were two good-quality randomised controlled trials that showed that, at 12 months, cranberries significantly reduced the incidence of UTIs. There were five trials that were not included in the meta-analysis because of methodological flaws or lack of data. It was noted that side effects were common in the treated group, and there was a high drop-out rate from several of the studies.

SOCRATES says

There is evidence that cranberries reduce the incidence of UTIs in women, but it appears that regular cranberries are not acceptable to all.

Jepson RG, Mihaljevic L, Craig J. Cranberries for preventing urinary tract infections. *Cochrane database Syst Rev* 2006;(4); CD 001321.

CRANBERRIES FOR TREATING URINARY TRACT INFECTION

Cranberries have been used to treat UTI for decades. Its efficacy is debatable.

Results

The reviewers found no trials that met their inclusion criteria.

SOCRATES says

There is no good-quality evidence that cranberry products treat UTI.

Jepson RG, Mihaljevic L, Craig JC. Cranberries for treating urinary tract infection. *Cochrane database Syst Rev* 2006;(4); CD 001322.

CONCLUSION

In this the third article of SOCRATES Episode II, we have presented the results of the search of the Cochrane Renal Group. In the next article, we will examine reviews relating to musculoskeletal medicine and trauma.

Authors' affiliations

P Gilligan, A Broderick, S Carr, Beaumont Hospital, Dublin, Ireland
 A Pountney, B Wilson, C Mehigan, E Kidney, P Jennings, D Godden, L Allonby-Neve, The Yorkshire Rotation, Yorkshire, UK
 J Cooper, G Lumsden, St James's University Hospital, Leeds, Yorkshire, UK
 D Hegarty, Ballymun Health Centre, Ballymun, Dublin, Ireland
 J Lee, York Hospital, York, Yorkshire, UK
 A Khan, Bradford Royal Infirmary, Bradford, Yorkshire, UK
 M Shepherd, Pinderfield Hospital, Wakefield, Yorkshire, UK
 S Wilson, Huddersfield District General Hospital, Huddersfield, Yorkshire
 J O' Sullivan, The Mater Hospital, Dublin, Ireland

Funding: None.

Competing interests: None.