

# PRACTICE

## CHANGE PAGE

### Avoid prescribing antibiotics in acute rhinosinusitis

Change Page aims to alert clinicians to the immediate need for a change in practice to make it consistent with current evidence. The series advisers are Sera Tort, clinical editor, and David Tovey, editor in chief, the Cochrane Library. We welcome any suggestions for future articles ([change@bmj.com](mailto:change@bmj.com)).

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Acute rhinosinusitis (ARS) is an acute inflammatory condition of the nose and sinuses that is characterised by sudden nasal blockage, discharge, facial pain, or pressure and reduction in smell in adults or cough in children.<sup>1</sup> It is common, having a global prevalence of 6-15%,<sup>1,2</sup> and it is usually managed in primary care. Despite consistent evidence of spontaneous resolution and recommendations to restrict antibiotics to severe illness, more than 80% of people with ARS receive antibiotics in Europe and North America.<sup>2-5</sup> Prescription rates might be lower (30%) in Asia, although over the counter availability of antibiotics in some settings makes accurate figures difficult to ascertain.<sup>2</sup> High prescribing results in pressure for antibiotic resistance and in adverse events. However, the primary cause of ARS is postviral inflammation. Fewer than 2% of patients have the more severe presentation of “bacterial ARS,” a clinical rather than microbiological diagnosis characterised by discoloured discharge, severe local unilateral pain, fever (>38°C), raised levels of inflammatory markers (erythrocyte sedimentation rate and C reactive protein) and/or “double sickening” (deterioration after an initial milder illness).<sup>1</sup> The gold standard diagnostic test of true bacterial ARS is a positive culture from an invasive sinus puncture or meatal swab (ideally endoscopically guided); radiological opacification of the sinuses has less diagnostic value.<sup>1</sup> Neither bacteriology nor radiology is recommended in making the clinical diagnosis of bacterial ARS or guiding management. Individual symptoms are poorly predictive, but there is limited evidence to suggest that combinations of clinical factors (while not diagnostic of bacterial infection) may alert clinicians to patients with more severe and prolonged illness—for example, lasting beyond 10 days or worsening after 5-7 days—who should be monitored and considered for more intensive treatment, including antibiotics.<sup>6,7(8)</sup>

The diagnostic criteria for bacterial ARS are similar between guidelines, derived from expert consensus and observational data, and the box outlines two examples.<sup>1,8</sup> These centre on the severity, character, and duration of symptoms as cited above. About a third of those with a clinical diagnosis of ARS will have bacteria identified on endoscopic sampling,<sup>9</sup> and most of these people will recover fully without antibiotic treatment. No controlled trials have shown that even bacterial ARS requires an antibiotic, although placebo controlled studies might be deemed unethical in those with a more severe illness. All current guidelines state that the combination of at least three of the severe symptoms and signs listed in the box should make the clinician at least consider antibiotic treatment.<sup>10,8</sup> We propose avoiding prescribing antibiotics in ARS unless several of the features given in the box are present.

#### The evidence for change

Systematic reviews show that uncomplicated ARS resolves without antibiotic treatment.<sup>11,12</sup> A Cochrane review of antibiotics against placebo in adults with ARS found 10 trials (eight from primary care) with a low risk of bias, involving 2450 participants. Antibiotics provided no meaningful benefits; they can marginally shorten the time to cure (by less than half a day), but only five more participants per 100 will be cured by 7-14 days, and 18 participants (95% confidence interval, 10 to 115) will need to be treated for one patient to be cured more quickly. This needs to be weighed against adverse effects of antibiotics—the number needed to treat to harm was only 8 (95% confidence interval 6 to 13)<sup>11</sup> with the most common adverse events being gastrointestinal disturbances (nausea, vomiting, diarrhoea) and rash. Serious adverse events were uncommon in both arms. Given the lack of clear benefits and the pressing global problem of antibiotic resistance,<sup>13</sup> the authors

**Key points**

Only consider prescribing antibiotics in patients with symptoms of acute rhinosinusitis (ARS), for instance with at least three of the following more severe symptoms: purulent secretion, high fever, severe (unilateral) facial pain, prolonged illness (7 days or more), and/or "double sickening."

The prescription of antibiotics does not prevent serious complications in ARS

**Combinations of clinical factors that may indicate more severe disease and consideration of antibiotic therapy**

Bacterial ARS is characterised by the presence of at least three of the following symptoms in European guidelines:<sup>1</sup>

- Discoloured discharge (with unilateral predominance) and purulent secretion in the nasal cavity

Diagnosis of bacterial ARS requires the presence of at least two of the following symptoms, which must include item 2 or 3, and symptoms persisting beyond 10 days or worsening after 5-7 days in Canadian guidelines:<sup>8</sup>

- Facial pain, pressure or fullness,
- Nasal obstruction,
- Nasal purulence or discolored postnasal discharge,
- Hyposmia or anosmia

state: "there is no place for antibiotics for the patient with clinically diagnosed, uncomplicated acute rhinosinusitis."

A separate Cochrane review of antibiotics versus placebo for acute maxillary sinusitis (a common subgroup of ARS) with symptoms lasting at least seven days<sup>14</sup> found six controlled trials. There was a modest symptom resolution benefit with antibiotics, but improvement was high in both the placebo (80%) and the antibiotic treated groups (90%). There was also only a marginal difference in "total cure" rates between groups, with antibiotics resulting in a small reduction in relative risk of ongoing symptoms at 7 to 15 days (0.73, 0.63 to 0.85). The authors conclude that the modest benefits must be weighed against the potential for adverse effects at both individual and population levels.

The evidence shows that in a primary care setting, antibiotics have little if any role in ARS in adults and only a small treatment effect in patients with severe symptoms that persist beyond a week.<sup>14</sup>

Non-antibiotic treatment options include information on disease course, reassurance, and symptomatic treatment. Although widely used, there is no convincing evidence of clinically relevant benefits from antihistamines, steam inhalation, decongestants, or saline irrigation.<sup>15</sup> Topical nasal steroids have been shown to have a modest effect on symptoms and speed of recovery.<sup>16</sup> A Cochrane review found that symptoms of participants receiving this treatment were more likely to resolve at two weeks compared with those receiving placebo (73% v 66.4%; risk ratio 1.11, 1.04 to 1.18). This modest benefit is similar to that observed for antibiotics. Although this review reported no significant adverse events, possible adverse effects can include nasal irritation and epistaxis.<sup>17 18</sup> Current topical nasal steroid preparations are not licensed for this indication.

**Barriers to change**

Doctors want to prevent serious complications of ARS, such as orbital or intracranial abscess, which represent medical emergencies requiring prompt recognition and treatment. Clinical case series from specialist units treating these complications, however, suggest that they occur rarely and early in the course of the disease, and that the prevalence and the outcome are not influenced by early antibiotics in primary care.<sup>19 20</sup>

Research evaluating drivers for overprescribing antibiotics in respiratory tract infections suggest uncertainty in diagnosis and management, perceptions of patient expectation and potential

conflict with patients,<sup>21</sup> availability of antibiotics over the counter,<sup>22</sup> and unawareness of local resistance problems<sup>23</sup> are important. Professional education and communication training, with or without additional near patient C reactive protein testing, can substantially reduce antibiotic use in respiratory infections.<sup>24</sup>

**How should we change our practice?**

Antibiotic treatment should not be used in adults with uncomplicated ARS, and we propose that it should only be considered for the small minority with features such as high fever, severe (unilateral) facial pain, purulent rhinorrhoea and "double sickening."<sup>1</sup>

Non-antibiotic treatment strategies centred on symptom control and the provision of information on the inflammatory but non-bacterial self limiting nature of the disease, and the lack of benefit and potential harm of antibiotics, should be usual first line management, for both individual and population health considerations.

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