There are many myths surrounding antibiotics. Evidence will be required to disprove them.

Myth-busting takes time

In the early days, antibiotics were referred to as a «magic bullet» – a projectile that spares friends and injures foes (1). Ideally, antibiotics should distinguish perfectly between «us» – our sterile, immaculate bodies – and «them» – bacteria that invade the body and render it dirty and sick. As in other areas of life, it is tempting to blame «them» – and reach for the antibiotics.

And sometimes that is correct. The discovery of *Helicobacter pylori* as a cause of peptic ulcers led to ulcers being redefined from psychosomatic disorder to infectious disease. This is an appealing model for researchers, clinicians and patients who find the cause of their particular affliction to be poorly understood. Chronic ailments following possible tick bites, persistent back pain, and autism have all been claimed to be the new peptic ulcer. Treatment centres have been established to provide long-term antibiotic therapy for these conditions – outside the established healthcare system.

Sooner or later we may discover a new «peptic ulcer» – but treatments that risk adverse effects for both the individual and society should not be established until their efficacy has been demonstrated. The myths surrounding antibiotics appear to behave in the same way as antimicrobial resistance itself – «easy to get, hard to lose» (2).

The potential for this type of unproven long-term antibiotic use to lead to antimicrobial resistance has received much attention. But in fact, the less spectacular myths surrounding antibiotics contribute more to their unnecessary use. Efforts have been made recently to shatter one such everyday myth: A course of antibiotics must always be completed, otherwise the bacteria will become resistant (3). There is something grating about this command, an authoritarian «Eat your food!» even though you are completely full. Unsurprisingly patients do not obey it either – more than half of those receiving antibiotics in general practice for a lower respiratory tract infection fail to complete the course (4).

There is also no evidence to suggest that the claim is true. To reduce the risk of resistance, the overall use of antibiotics should be as low as possible and the proportion of narrow-spectrum antibiotics as high as possible (5). The length of an antibiotic course should therefore be determined by its clinical effectiveness: the course should be just enough to avoid therapy failure and recurrence. To avoid unnecessarily long courses in general practice, there are two options: either shorten the recommended course, or advise patients to do as they do already, namely discontinue treatment when they feel better.

The recommended length of a course of antibiotics is fairly arbitrary – it may reflect a long-established convention or be based on the manufacturer's decisions in earlier drug studies (6). A meta-analysis found that short courses of antibiotics are essentially as effective as long ones (7). However, there is still a shortage of good studies, and those we do have are often based on broader spectrum antibiotics than those we in Norway are fortunate enough to be able to use.

The second possibility is thus to give the patient a role in evaluating their infectious disease. This is the principle behind the wait-and-see prescription – the patient is tasked with starting an antibiotic course only when certain criteria are fulfilled. Numerous studies have shown that this method yields a safe reduction in antibiotic use, and most patients and doctors are satisfied with it. Since 2008, Norwegian guidelines have therefore recommended wait-and-see prescriptions for certain diagnoses and under certain conditions. This has, however, been a long process: the first studies on such prescriptions date from 1997. In the same way, patients can monitor the effects of a course of antibiotics and discontinue treatment when they feel better. But it would be hard to recommend such a strategy for Norwegian general practitioners before we have studies showing it to be safe.

To rid ourselves of harmful myths about antibiotics and to prevent new ones from becoming established requires first and foremost good data. Given that 80 % of all antibiotics are prescribed in general practice (9), it is important for data to be obtained there. And because antibiotic resistance and treatment practices vary from country to country, data should be obtained in Norway. The 14 million annual consultations in Norwegian general practice are woefully underexplored. It is here that the bulk of diagnosis and treatment occurs, and yet there are no established systems for clinical research in general practice. A general practice research network (10) would hardly be as entertaining as the American documentary *MythBusters* – but cheaper and more important nonetheless.

Sigurd Høye
sigurd.hoye@medisin.uio.no

Sigurd Høye (born 1972), postdoctoral researcher at The Antibiotic Center for Primary Care, Department of General Practice, University of Oslo, general practitioner and editor for the Journal of the Norwegian Medical Association (on leave). He is also a member of the editorial board for the National Guidelines for the Use of Antibiotics in Primary Care.
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