

Antimicrobial stewardship: lessons from human healthcare

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Summary

This paper focuses on antimicrobial stewardship in human healthcare, and some concepts possibly transferable to veterinary medicine. Antimicrobial stewardship is a multidisciplinary effort to reduce antimicrobial resistance in human pathogens, when future drug development is dwindling. These strategies encourage healthcare staff to use antimicrobials prudently and, when needed, for as short a duration and with as narrow a spectrum as possible. Various methods are involved in stewardship within the healthcare setting, often implemented simultaneously, which sometimes makes evaluation of specific measures difficult. All healthcare workers must accept responsibility for stewardship, although the role of infectious diseases physicians, microbiologists, pharmacists and infection control practitioners is crucial, as are appropriate surveillance systems and information technology. Support from management and government is also beneficial. Considering the frequent use of antimicrobials in animals, it would seem sensible to apply a similarly critical approach to conserve the efficacy of the antimicrobials still available, now and in the future.

Keywords

Antimicrobial agents – De-escalation – Healthcare-associated infection – Human healthcare – Rational prescribing – Resistance – Stewardship – Surveillance.

Overview of the use of antimicrobials in humans

The discovery of antimicrobials has been one of the cornerstones of modern medicine. Antibiotics, antivirals and antifungals completely transformed medicine in the 20th Century. These drugs allowed modern medicine to flourish, and reduced human morbidity and mortality from infection significantly. Cure of an infectious disease is now expected by most people in the developed world and is often taken for granted. However, we are approaching the end of this antimicrobial era, with the arrival of increasingly difficult to treat 'superbugs'. Bacteria have continued to evolve at an alarming rate while the pharmaceutical industry and many in the medical profession have become complacent. If we are to continue benefiting from antimicrobials, more judicious use by all those that employ them will be critical. This concerted global effort must begin as soon as possible.

Prudent and efficacious use of antimicrobials in healthcare settings

Antimicrobial stewardship is often thought of as a new concept, a result of increasing resistance and concerns over healthcare-associated infection (HAI), but the origins date back to the 1970s. In fact, certain elements have been present since the beginning. In 1946, Alexander Fleming wrote that penicillin should only be used in instances where an organism is susceptible, and should be given by the appropriate route, in an adequate dose, for an appropriate period of time. He also reminded the prescriber to take no heed of demands from patients or the media for the use of penicillin for inappropriate indications. Although much has changed in medicine, over 60 years on, his recommendations still hold true. The identification of organisms has become more rapid,

microbiological testing has increased in complexity, antimicrobials have become more diverse, but patients' wishes and the media are still playing their part.

It has been shown with reasonable consistency that about 30% of the hospital population is being given some kind of antimicrobial at any one time (2, 28). It is also known that up to 50% of antimicrobial prescribing is inappropriate, either with respect to indication, route, dose, known allergies, or susceptibility data (9, 30). Antibiotic resistance rates have spiralled to catastrophic heights, and patients in the developed world are beginning to die from infections that are resistant to all known antimicrobial agents (12). In addition to this, the rates of HAI are unprecedented, with methicillin-resistant *Staphylococcus aureus* (MRSA) and *Clostridium difficile* causing epidemics in their own right. The bleak and rather stark horizon devoid of any new antimicrobial classes sadly seems to be going unnoticed by many clinicians (4, 23). The way in which antimicrobials are being used is changing, but it still needs to change further, and quickly. If prescribing trends continue at the current rate with no active intervention, the era of antimicrobials may soon be over.

In the developed world, the economic burden of healthcare is phenomenal (10). Economically, it makes sense for patients to be diagnosed quickly, treated efficiently and safely, and be in hospital for as little time as possible (8). Length of stay is associated with a daily increasing risk of acquiring a new infection. Indwelling devices and catheters, and prolonged antibiotic therapy, are associated with the likelihood of acquiring secondary infection, or complications due to therapy. The use of certain antibiotics, in particular the third-generation cephalosporins and ciprofloxacin, has been associated with increasing rates of hospital-acquired MRSA (18, 19). The notorious 'four C antibiotics', namely the cephalosporins, ciprofloxacin, co-amoxiclav (representative of broad-spectrum beta-lactams) and clindamycin (the lincosamide/macrolide most commonly described in the literature), are known to be associated with epidemics of *C. difficile* (14, 20, 27). The associated morbidity, mortality and economic burden of additional, potentially preventable, days of hospitalisation have meant that the task of attempting to control antibiotic use has become urgent (9).

Antimicrobial stewardship

Antimicrobial stewardship involves a multi-faceted approach to try and improve the prescribing of antimicrobials (24). Ideally, an antimicrobial stewardship programme should involve a multidisciplinary team of healthcare workers, comprising a minimum core of an infectious disease physician and a clinical pharmacist with

training in infectious diseases. It is important that these members are compensated for their time in this crucial role. The inclusion in the team of a clinical microbiologist who can give advice on local resistance patterns would be beneficial. The optimal multidisciplinary team would consist of these three professionals together with an infection control professional and hospital epidemiologist. Given that data collection will be complex and needs to be performed in real time, computer support for surveillance and for implementation of recommendations should be provided by an information systems specialist (9). Each of these members plays an important role in ensuring the correct choice, dosing, route and duration of antimicrobial therapy for patients in the hospital, and drawing up hospital guidelines for infection management. Often, antimicrobial stewardship is difficult to evaluate in a randomised controlled trial, because it comprises many different strategies, which are frequently introduced simultaneously (9). The main elements are outlined below.

Formulary restriction

A comprehensively reviewed and restricted formulary is one way of influencing the use of all or certain antimicrobial agents (16). A hospital formulary can allow the use of certain drugs for permitted indications. Often the restrictions in a hospital formulary are based on drugs for specialised indications, which require certain expertise or experience to prescribe, the drug cost, or more often a combination of these. The concept works well for certain antimicrobial agents for the same reasons. If the antimicrobial stewardship team have contributed to the empirical antimicrobial guidelines, they are well placed to decide when certain agents can be used, or who may be involved in the prescription of them. This is particularly helpful for certain key antibiotics, for example the carbapenems, to prevent mis- or overuse of agents that need to be used sparingly and appropriately if their efficacy is to be maintained (9). If there are good hospital guidelines they can be audited, and underperforming or non-compliant areas can then be identified and targeted for specific interventions such as education. There are several ways in which formulary restriction can be achieved. Pre-authorisation is one of the most frequently described. This involves having a gate-keeper, who can approve the indication for which an antimicrobial is being used and who can assess the appropriateness of therapy. Unfortunately, this requires resources in the form of infectious diseases or clinical microbiology support 24 hours a day. Concerns have also been raised, in situations where it is impossible to have timely support, or support out of hours, that patients with sepsis may suffer delays in receiving the necessary antimicrobial therapy, with the foreseeable undesirable consequences. In addition, physicians have been known to employ stealth tactics, and to change their prescribing habits in order to

avoid having to get pre-authorisation, for example prescribing off-formulary antimicrobials outside normal working hours. Solutions to these problems include allowing 'one-off' doses of such antimicrobials, with the knowledge that their prescription will automatically instigate follow-up by a member of the antimicrobial stewardship team.

Antibiotic cycling

Antibiotic cycling has previously been described as a method of controlling resistance by restricting antimicrobials over a certain period of time. Resistance to a certain antibiotic may be seen to decline once it has been replaced by another antimicrobial for routine use, but it is likely that resistance may increase over time to whichever substitute agent has been chosen. This has been described as 'squeezing the balloon'. Often it is difficult to implement antibiotic cycling in its truest sense in practice because there may be many contraindications to giving a patient the current 'in-use' antimicrobial. Relatively little study has been performed into whether heterogeneous use of antimicrobials slows the spread of resistance. Without robust data, and with the difficulties in implementation, cycling is rarely advocated (26). Lack of heterogeneity may however be a built-in weakness of current strategies which rely heavily on standard policies and formularies that may change little over the years.

Streamlining antibiotic prophylaxis

One of the key areas in which antibiotics are extensively used in the hospital is the area of prophylaxis. All surgical units use antimicrobial prophylaxis routinely. Although there seems to be a consensus among guidelines to suggest when the use of antibiotics is appropriate, the precise agent is rarely stated. The abundant use of cephalosporins for prophylaxis in surgery, particularly in prosthetic joint insertion, has been reduced following increased rates of *C. difficile* infection. The latest guidelines in many countries now favour narrower-spectrum agents that will give less broad but appropriate cover. Prophylaxis is often continued far beyond the perioperative period, but in an ideal world prophylaxis would not continue post-operatively. A common compromise in major implant surgery (where the consequences of infection are most severe), in the absence of robust data, is to give antibiotic prophylaxis for up to 24 hours from the time of the initial dose, and at most one hour before the procedure. In certain situations prophylaxis is continued for many days, or until another predetermined time point; for example, when all catheters have been removed. Not only do these long courses have cost implications, they also have unintended, and for the surgeons who use them perhaps underappreciated, implications in terms of ecology and propagating bacterial resistance (particularly MRSA with

cephalosporin use). Long courses of antibiotics also have more direct consequences for the patient, for example *C. difficile* infection (6, 17). One of the big improvements that can result from antimicrobial stewardship is a list of specific, appropriate antibiotic choices for operative procedures carried out in the hospital, which can then be audited for compliance with regard to doses, timing, choice and duration. Understandably, surgeons are often reluctant to relinquish regimes with which they are familiar, and for which they have anecdotal evidence of effectiveness. Standardisation, together with an uncompromising focus on patient safety and ecological concerns, is the role of antimicrobial stewardship here.

De-escalation of therapy

De-escalation of therapy is a very important component of antimicrobial stewardship programmes. It comprises two main elements. The first is to narrow the spectrum of antimicrobial therapy once the results of susceptibility testing become available, if a broad-spectrum empirical regimen has been started initially; the second is a timely switch from intravenous (IV) to oral administration. With an increasing potential for very broad empirical antibiotic regimens, it remains crucial that therapy is tailored once a pathogen has been found or a source located. For many patients who are very unwell when they arrive at a healthcare facility with an infection, the exact identity of the causative pathogen is often not known. In these instances, particularly in patients who have had frequent contact with healthcare institutions, or who have been in hospital for more than 48 or 72 hours and are at high risk of HAI, appropriate broad-spectrum antimicrobial cover is necessary. However, it is important that once the pathogen is known and susceptibility to an agent with a narrower spectrum of activity is established, a switch in therapy should be implemented. This will reduce exposure of pathogens in the healthcare environment to these broad-spectrum agents, and reduce resistance in the environment and other patients.

The IV to oral switch remains a cornerstone of de-escalation (9). The risks of intravenous catheters are well documented, with secondary infection being a primary concern. Any circumstances in which these devices can be avoided should be maximised. There are also cost savings to be made in terms of the antimicrobials themselves, the equipment and expertise of the staff required to administer them, and the cost of infections associated with devices, which can often be substantial.

The role of pharmacists in monitoring or 'policing' prescribing on the wards is paramount, and they can help to educate prescribers, both in terms of highlighting the use of broad-spectrum antimicrobials, and advising narrowing of the spectrum where possible, and

recommending oral antimicrobials as soon as possible. Many prescribing decisions are left to quite junior members of a team. It is necessary that ongoing education and support from clinical microbiology services and pharmacists is available to assist in building the confidence of all prescribers. This crucial aspect of antibiotic use is often ignored, and an antimicrobial stewardship programme can assist in its promotion.

Decision support mechanisms

As mentioned previously, much of the prescribing in hospitals is left to very junior members of the healthcare team. The implementation of a computer-aided decision support mechanism would be greatly beneficial. Many of the more frequent instances of miscalculation of doses, or prescribing errors associated with allergies, could be avoided. If a prescribing system (ideally electronic, with decision support) were fully integrated with the microbiology laboratory services, appropriate drugs could be highlighted once susceptibility data became available, which would prevent mismatches and also prompt de-escalation of therapy (5). However, this would require data sharing, and significant input and technical support for the large amounts of data. Many hospitals do not have the computing infrastructure and networking to allow communication between their many systems, but there is an increasing array of systems on the market that can help to overcome this.

Education

Education forms a very important part of any antimicrobial stewardship programme. It is crucial that attention is focused on improving the prescribing of antimicrobials at a time when treating infection appropriately has become very complex. All of the above elements can assist with education, but many separate approaches to education have been also been tried, often with limited success. Teaching is often not a role that is specifically allocated to anyone on the antimicrobial stewardship team, and teaching alone has not been shown to be an efficient way to improve or alter prescribing. So far, research has shown that the most effective route is through feedback from audit. Figures on improved patient outcomes resulting from stewardship are very difficult to obtain, as there is a lack of good data from randomised controlled trials. However, data are available on appropriate antibiotic choices (based on protocols or sensitivity results from the microbiology laboratory), reductions in MRSA or *C. difficile* rates, and reduced prescribing costs, all of which are tangible measures of improvement for physicians. Education through regular audit feedback, and comparison of personal practice with that of peers, is one of the crucial functions of an antimicrobial stewardship programme (13). This is something that can be provided by the stewardship team. Although this can be a costly endeavour,

when feedback can be focused on key areas, or certain physicians, resources and time can be used economically (9).

Support from hospital management/government

Support from management (and if possible from government) is a crucial part of the process of antimicrobial stewardship. Many physicians are reluctant to relinquish prescribing power, particularly if they have personal experience with certain antibiotic regimens that they know work well for them. It is also sometimes difficult for individual prescribers to see the bigger picture of antibiotic resistance, and it helps for them to know that policies are universal across all prescribers within a hospital. This direct approach needs the support of hospital directors and managers (3). The known economic benefits, and decreased patient mortality/morbidity, can provide the impetus for this support. Without this drive and support from the top, the desired change in prescribing habits can be hard to achieve. Although it is important that members of the antimicrobial stewardship team are compensated for their time, in reality this is by no means universal (16). Without the support of management, the appropriate allocation of funds from the appropriate budget is also difficult. Recent experiences in Scotland emphasise the benefits of a national approach, well funded by government, with which barriers to implementation can easily be removed (Scottish Antimicrobial Prescribing Group: www.scottishmedicines.org.uk/SAPG).

Bundles/heterogeneity of change

Care bundles consist of evidence-based practices that improve patient care. When these practices are grouped together within a specific time frame, they improve care more than each practice would if it were used alone. Each bundle usually consists of a small number of elements (usually three to five) that are necessary to improve the quality of care (21). Compliance is measured using an 'all or nothing' approach, and the use of this dichotomous approach makes it relatively straightforward to monitor performance and improvement in practice or outcomes after the implementation of a bundle. Stewardship programmes lend themselves to a bundled approach because of the multi-faceted nature of the alterations required to bring about change (7).

The role of infection control

The role of antimicrobial stewardship has to be appreciated in the context of a multidisciplinary drive to improve healthcare. In the United Kingdom, as in many other countries, prevention and control of infection play a crucial role in preventing the spread of many pathogens, notably MRSA, *C. difficile*, and the increasingly prevalent

multidrug-resistant Gram-negative Enterobacteriaceae. Without surveillance support, and control of spread resulting from the use of coordinated reporting systems between the infection control team and the microbiology laboratory staff, the increase in patient mortality, morbidity, length of stay and resultant increased costs would be considerable. These personnel are appropriately placed to enhance the effectiveness of the antimicrobial stewardship team, both by their surveillance and reporting activities and by enforcing good adherence to infection and control practices and other hospital policies that help to reduce hospital-acquired infection.

Automated surveillance/real-time trends

In order to appreciate local susceptibility patterns, and to identify trends or outbreaks in real time, a considerable surveillance effort is necessary. One of the best ways of achieving this is by the use of computer systems designed to highlight these specific areas. There are a variety of systems available on the market that have the capacity to deal with such large amounts of data. The use of these systems would help to alleviate some of the strain on both clinical microbiology services and the infection control team. Much of the benefit seen with automated systems results from the fact that many aspects of stewardship can be implemented simultaneously. One initial outlay can have many benefits, and such a system could certainly prove its efficiency in economic terms.

Development of cost-effective, rapid, sensitive methods of diagnosis/resistance detection

The ultimate goal of microbiology is to realise the ideal of real-time, bedside diagnostics. It would be helpful for clinicians to know which antimicrobial to use and whether or not to isolate a patient at the point of care, especially in the healthcare setting where single room facilities are limited. Although much of the necessary technology is beginning to become available, the cost is prohibitive at the present time for most healthcare providers. However, the cost savings associated with timely diagnosis, appropriate antibiotic therapy and isolation precautions, reduced lengths of stay and reduced complications would none the less be significant. In an environment where resources are constrained, the expected benefits would be impressive. It is hoped that the cost of these tests will continue to fall, as an increased range comes to the market, and in time this will allow their incorporation into routine clinical practice.

Increased molecular understanding of the spread of resistance

More research is needed into the molecular mechanisms of resistance and their spread. This is necessary in order to

find a means of combating resistance when developing new antimicrobial agents, but also to increase understanding of the ecology of antimicrobial use. Despite the fact that combination therapy is widely practised, very little is known about how this influences the development of resistance, except in the case of tuberculosis and human immunodeficiency virus. Quorum sensing, SOS signals, plasmids, transposons, pathogenicity islands, pro-phages and biofilms are other important ways in which bacteria continue to survive and evolve despite the onslaught of the entire antimicrobial arsenal. A greater understanding of all these elements will help in the fight against infection, and provide options for future therapeutics.

Stimulation of research and the development of new drugs

Pharmaceutical companies have moved away from research into the development of antimicrobials. There are, at the time of writing, no new antibiotics under development that work in different ways from any currently available drug, meaning that for our currently pan-resistant (and globally spreading) bacteria, there are going to be few new drugs to combat them. There needs to be a dramatic increase in the development of new antimicrobials. The shortfall in funding for this may need to be obtained from sources other than the big pharmaceutical companies, and/or the industry may require increased incentives for drug development. Of late, governments and professional societies have taken a leading role in discussions to stimulate new drug development and stewardship. Recently, a transatlantic alliance of the European Union and the United States governments has been formed. The Infectious Diseases Society of America, the European Society of Clinical Microbiology and Infectious Diseases, and the International Society of Chemotherapy are all active in this area, but there are no easy solutions (1). Much traditional expertise on natural product screening has been lost, and new rapid-throughput screening techniques have detected possible targets but no new antibiotics. It is hoped that work on this front will continue to progress.

The role of audit and review

As alluded to in previous sections, antimicrobial stewardship is an ongoing process that is inherently under review, and needs the capacity to change as and if required. Some aspects of a programme may work exceptionally well in certain healthcare settings, whereas others may not be as effective with respect to the economic outlay or time required for their implementation, or may not be possible at all in other settings. One size does not, and will not, fit all, so in order to monitor progress and trends it is imperative to audit whichever interventions are decided

upon by the antimicrobial stewardship team. The results of these audits should not only serve to educate the healthcare workers, but also to demonstrate to the stewardship team the success or failure of any interventions, so that the programme is kept under review and can be adjusted if necessary.

Antimicrobial use outside the developed world

Unfortunately, antimicrobial use in developing and in-transition countries is very different from that in the developed world, and as such deserves to be reviewed separately. The situation relating to antimicrobial use in these countries is complicated by problems of both excess and access. With many analogies to anthropogenic global warming, the desire of some countries to improve access to antibiotics in populations who have previously suffered from under-treatment has led to excess provision of antibiotics, with very poor regulation of quality and often poor access to good medical advice. Inadequate courses (often single tablets) are frequently sold without prescription, leading to a huge problem of over-exposure and under-treatment. Both lead to resistance, which is rapidly spread as a result of overcrowding and poor sanitation. In an era of global transport of both humans and food, it is no surprise that many types of resistance originate in this environment and soon spread to others (29). These include some of the epidemic cefotaximases and carbapenemases. Continuing the analogy with global warming and completing the circle, natural disasters promoted by global warming further aggravate the situation by exacerbating overcrowding, which is accompanied by deterioration in sanitation.

The manufacture of generic antibiotics is a multi-billion dollar industry worldwide, with poor regulation. There is increasing concern about the quality control of many generic drugs, which appear to have much less rigorous requirements for their licensing than the original version of the antibiotic. Frankly, counterfeit 'drugs' and Internet access to, and marketing of, antibiotics are also likely to be growing problems but there are few data on these aspects.

Critically important antimicrobials for multi-resistant organisms

The increase in resistance in Enterobacteriaceae, with no new drugs under development, encourages a cautious

approach to the use of the antimicrobials that are currently useful. Despite the emergence of various mechanisms of resistance, including extended-spectrum beta-lactamases and AmpC, there is one group of antimicrobials that still retains activity against these organisms, namely the carbapenems. However, emerging and various novel mechanisms of resistance, including *Klebsiella pneumoniae* carbapenemases and the New Delhi metallo- β -lactamase 1, may render these antibiotics useless. With no new antibiotics that have good activity, clinicians in some parts of the world are now forced to rely on old and almost-forgotten antibiotics. These were often relegated because of high toxicity profiles, or were poorly tolerated by patients (11). It is imperative that all clinicians, and indeed all those who use antibiotics, appreciate that changes need to be implemented in order to preserve the effectiveness of these agents, because current salvage therapy is suboptimal and often unsuccessful.

For Gram-positive infections the situation is slightly less critical. There are several newer agents available that have comparable efficacy to older antibiotics, although instances of resistance have already been reported to all of these agents. There is conflict in the literature regarding the description of a trend over time towards higher minimum inhibitory concentrations for vancomycin, the mainstay of treatment for MRSA infections (15). This has been described as the 'creep' phenomenon. These trends may mean that many MRSA infections can no longer be treated according to current guidelines, and may cause significant increases in the costs associated with newer agents.

The beneficial impact of antimicrobials and their uncertain future

Antimicrobials are one of the wonders of modern medicine. Not only have they given the ability to cure people, they have allowed advances in many other branches of medicine, and the use of procedures that would have been impossible without the ability to control infection. The necessary short courses of immunosuppression that allow the treatment and sometimes cure of cancer patients, and the immunosuppression required long term for transplant patients, would be impossible without adequate antimicrobial therapy. Similarly, complex surgery and the use of implants or implantable devices would become very high-risk operations, with a much decreased success rate, were it not for prophylactic antibiotics to cover against infection during the procedures. In fact, medicine as we know it would change dramatically were antimicrobials no longer available. Sadly this is a probable outcome if we do

not address the current resistance crisis. Without new strategies for the global problem, many more people will die from what are currently thought to be preventable infections. Antimicrobial stewardship is a strategy that could lend the much needed structure for a new approach to the use of antimicrobials, one that appreciates their exceptional role in healthcare and the miracle that they are.

Implications for antibiotic use and antimicrobial stewardship in animals

Estimates of antibiotic use outside human medical care suggest even greater total use, of over 100,000 tonnes annually worldwide. It is increasingly obvious that this is leading to an ecological disaster, with environmental pollution, contamination of food both with antibiotic residues and resistant bacteria, and an interchange of resistant bacteria and genes between humans and animals in both directions (25). Any antibiotic use in humans can, ultimately, affect animals and vice versa. Therefore, as well as trying to implement lessons learnt in human medicine when it comes to antibiotic use in animals and agriculture, it has been suggested that classes of antibiotics should be segregated so that cross-resistance and the spread of resistance between the two areas is limited (22). However, this is easier said than done, owing to the limited number of separate classes of antibiotics available.

Setting apart antibiotic use for growth promotion, where there is no obvious parallel in human medicine, there are some lessons learnt from antimicrobial stewardship in humans that could be applicable in animals. For example, the tendency to overuse antibiotic prophylaxis in human medicine has been largely counteracted by robust scientific

evidence that a short course is just as efficacious as a long course and has fewer side effects. This refers to perioperative prophylaxis, however, and how applicable these principles are to mass post-exposure prophylaxis in intensively reared animals is uncertain. Robust measurement of antibiotic use is a useful means of benchmarking quantity and perhaps quality of prescribing and is now commonly used in human medicine. This is certainly something that should be considered in veterinary medicine. With electronic data capture, these measures should be easier to introduce in future, although some data may be commercially sensitive. In terms of regulating antibiotic consumption, the non-prescription sale of antibiotics is another difficult area that needs to be addressed in many countries, and is crucial for comprehensive stewardship. Limited drug lists have obvious attractions as they can help to limit costs and reduce the use of broad-spectrum agents, but they must be balanced with an attempt to maintain as much diversity in prescribing as is possible. This is possibly the best mechanism for slowing the development of resistance, in the absence of a reduction in the level of use. Short courses of treatment and dosing schedules that have been improved according to modern pharmacokinetic/pharmacodynamic principles have also been helpful, both in improving outcomes and in reducing use and resistance. The same may also be true for taking a more critical attitude to antibiotic combinations.

Overall, the message for treatment of both humans and animals must be to take a much more critical attitude to antibiotic use in light of the clear problems with antibiotic exposure. Users should always ask themselves whether the use justifies the side effects and risks of resistance, both in the present and in the future.



Gestion de l'utilisation des agents antimicrobiens : les enseignements de la médecine humaine

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Résumé

Cet article traite de la gestion des agents antimicrobiens dans la pratique de la médecine humaine, dont certains concepts sont peut-être transférables à la médecine vétérinaire. La gestion des agents antimicrobiens désigne les efforts pluridisciplinaires entrepris pour réduire la résistance aux antimicrobiens des agents pathogènes affectant l'être humain, dans un contexte de déclin des perspectives de mise au point de nouveaux médicaments. Ces stratégies encouragent le personnel soignant à une utilisation prudente des

antimicrobios, en prevoyant, si nécessaire, une durée de traitement aussi courte que possible et pour un spectre aussi étroit que possible. Plusieurs méthodes sont concernées dans la gestion de l'utilisation des antimicrobios au sein des configurations des services de santé, dont certaines sont parfois mises en œuvre simultanément, ce qui rend difficile l'évaluation des mesures spécifiques. Tous les professionnels de la santé doivent accepter la responsabilité de cette gestion, même si le rôle des médecins spécialisés dans les maladies infectieuses, des microbiologistes, des pharmaciens et des responsables de la lutte contre les maladies infectieuses s'avère crucial, au même titre que l'existence de systèmes de surveillance appropriés et le recours aux technologies de l'information. Il est également utile de compter sur le soutien de la hiérarchie et de l'État. Compte tenu de l'utilisation fréquente des antibiotiques chez les animaux, il serait judicieux d'appliquer une approche tout aussi raisonnée en médecine vétérinaire afin de préserver l'efficacité actuelle et future des agents antimicrobios encore disponibles.

Mots-clés

Agents antimicrobios – Désescalade – Gestion de l'utilisation des antimicrobios – Infection associée aux soins de santé – Médecine humaine – Prescription raisonnée – Résistance – Surveillance.



Enseñanzas sobre la gestión de agentes antimicrobianos extraídas de la atención médica

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Resumen

Los autores examinan la gestión de los agentes antimicrobianos en el ámbito de la atención médica y algunos de los conceptos que ahí se manejan que posiblemente puedan aplicarse también a la medicina veterinaria. La gestión de los agentes antimicrobianos es una empresa multidisciplinar, cuyo objetivo se cifra en reducir la resistencia a los antimicrobianos que presentan los patógenos del ser humano, en un momento en que se van estrechando las perspectivas de desarrollo de nuevos medicamentos. En estas estrategias de gestión se alienta al personal de salud a utilizar los antimicrobianos de modo prudente y administrar, llegado el caso, tratamientos cuanto más cortos mejor y de un espectro lo más reducido posible. En los centros de atención sanitaria, la gestión de los antimicrobianos se concreta en la aplicación de varios métodos distintos, a menudo simultáneamente, lo que a veces dificulta la evaluación de una u otra medida concreta. Aunque todo el personal de salud debe hacerse responsable de la gestión, el papel de los médicos que trabajan sobre enfermedades infecciosas, microbiólogos, farmacéuticos y profesionales de la lucha anti-infecciosa reviste una importancia capital, al igual que los sistemas adecuados de vigilancia y las tecnologías de la información. También es importante que los administradores y las instancias públicas respalden esa labor. Teniendo en cuenta que los antimicrobianos se utilizan a menudo en animales, sería sensato aplicar en este ámbito un planteamiento crítico parecido, a fin de mantener la eficacia presente y futura de los antimicrobianos aún disponibles.

Palabras clave

Agentes antimicrobianos – Atención médica – Desescalada – Gestión – Infección asociada a la atención sanitaria – Prescripción racional – Resistencia – Vigilancia.



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