Antimicrobial resistance (AMR) in veterinary medicine – a general selection of references

Database: CAB Abstracts <2000 to 2013 Week 34>
Search Strategy:
*****************************************************************************
1 "antimicrobial resistance".mp. (3079)
2 AMR.mp. (182)
3 drug resistance/ or ll882.cc. (56869)
4 (ll070 or ll000 or ll080 or ll110 or ll120 or mm110 or mm000).cc. (260949)
5 (1 or 2) and 3 and 4 (661)
6 limit 5 to english language (573)
*****************************************************************************

<1>
Accession Number
20133408826
Author
Suojala, L.; Kaartinen, L.; Pyorala, S.
Title
Treatment for bovine Escherichia coli mastitis - an evidence-based approach.
Source
Journal of Veterinary Pharmacology and Therapeutics; 2013. 36(6):521-531. many ref.
Publisher
Wiley-Blackwell
Location of Publisher
Oxford
Country of Publication
UK
Abstract
Bovine mastitis caused by Escherichia coli can range from being a subclinical infection of the
mammary gland to a severe systemic disease. Cow-dependent factors such as lactation stage and
age affect the severity of coliform mastitis. Evidence for the efficacy of antimicrobial treatment for E.
coli mastitis is very limited. Antimicrobial resistance is generally not a limiting factor for treatment, but it
should be monitored to detect changes in resistance profiles. The only antimicrobials for which there is
some scientific evidence of beneficial effects in the treatment for E. coli mastitis are fluoroquinolones
and cephalosporins. Both are critically important drugs, the use of which in animals destined for food
should be limited to specific indications and should be based on bacteriological diagnosis. The
suggested routine protocol in dairy herds could target the primary antimicrobial treatment for mastitis,
specifically infections caused by gram-positive bacteria. In E. coli mastitis with mild to moderate
clinical signs, a non-antimicrobial approach (anti-inflammatory treatment, frequent milking and fluid
therapy) should be the first option. In cases of severe E. coli mastitis, parenteral administration of
fluoroquinolones, or third- or fourth-generation cephalosporins, is recommended due to the risk of
unlimited growth of bacteria in the mammary gland and ensuing bacteremia. Evidence for the efficacy
of intramammary-administered antimicrobial treatment for E. coli mastitis is so limited that it cannot be
recommended. Nonsteroidal anti-inflammatory drugs have documented the efficacy in the treatment
for E. coli mastitis and are recommended for supportive treatment for clinical mastitis.
Publication Type
Journal article.

<2>
Accession Number
20133374892
Four models are presented investigating risks present on Great Britain (GB) turkey farms in breeding and fattening flocks for ciprofloxacin and cephalosporin resistance. Risk factors for ciprofloxacin resistance in fattening flocks were sourcing of feed from national compounders, antimicrobial use in the flock and evidence of mice. Disinfection of floors and walls at depopulation, older flocks and division of the flock with partitions reduced the risk. In breeding farms holding over 10,000 birds, administration of fluoroquinolones within the last year and horses on the neighbouring farm all increased the risk, whereas replenishing foot dips more than once a week reduced the risk. For cephalosporin-resistant Escherichia coli on fattening farms, being an independent farm, having a watercourse near the poultry houses, dividing the flock with partitions and providing staff with gloves reduced the risk. Factors that increased the risk included if staff worked with other livestock and if there were pigs on neighbouring farms. This work suggests that good hygiene and biosecurity, rodent control and responsible use of antimicrobials on turkey farms might help minimise the prevalence of fluoroquinolone and cephalosporin resistance in E. coli, and restrict the spread of resistance genes to other organisms.
both sustainable animal health and food safety can continue to be aided by surveillance at the slaughterhouse level.

Publication Type
Journal article.

<4>
Accession Number
20133387001
Author
Woolhouse, M. E. J.; Ward, M. J.
Title
Sources of antimicrobial resistance.
Source
Science (Washington); 2013. 341(6153):1460-1491. 11 ref.
Publisher
American Association for the Advancement of Science
Location of Publisher
Washington
Country of Publication
USA
Abstract
In this article the authors discussed how antimicrobial resistance can spread from food animals to humans through different routes. Highlights focused on the animal or livestock-derived route which is responsible for Salmonella Typhimurium DT104 epidemic in the 1990's. The article also emphasized the role of genomic data (collected by the Scottish Salmonella Reference Laboratory) in elucidating the role of food animals in the spread of antimicrobial resistance in humans.

<5>
Accession Number
20133386005
Author
Benedict, K. M.; Gow, S. P.; Checkley, S.; Booker, C. W.; McAllister, T. A.; Morley, P. S.
Title
Methodological comparisons for antimicrobial resistance surveillance in feedlot cattle.
Source
BMC Veterinary Research; 2013. 9(216):(21 October 2013). 28 ref.
Publisher
BioMed Central Ltd
Location of Publisher
London
Country of Publication
UK
Abstract
Background: The purpose of this study was to objectively compare methodological approaches that might be utilized in designing an antimicrobial resistance (AMR) surveillance program in beef feedlot cattle. Specifically, four separate comparisons were made to investigate their potential impact on estimates for prevalence of AMR. These included investigating potential differences between 2 different susceptibility testing methods (broth microdilution and disc diffusion), between 2 different target bacteria (non-type-specific E. coli [NTSEC] and Mannheimia haemolytica), between 2 strategies for sampling feces (individual samples collected per rectum and pooled samples collected from the pen floor), and between 2 strategies for determining which cattle to sample (cattle that were culture-positive for Mannheimia haemolytica and those that were culture-negative). Results: Comparing two susceptibility testing methods demonstrated differences in the likelihood of detecting resistance between automated disk diffusion (BioMICReg.) and broth microdilution (SensititreReg.) for both E. coli and M. haemolytica. Differences were also detected when comparing resistance between two
bacterial organisms within the same cattle; there was a higher likelihood of detecting resistance in E. coli than in M. haemolytica. Differences in resistance prevalence were not detected when using individual animal or composite pen sampling strategies. No differences in resistance prevalences were detected in E. coli recovered from cattle that were culture-positive for M. haemolytica compared to those that were culture-negative, suggesting that sampling strategies which targeted recovery of E. coli from M. haemolytica-positive cattle would not provide biased results. Conclusions: We found that for general purposes, the susceptibility test selected for AMR surveillance must be carefully chosen considering the purpose of the surveillance since the ability to detect resistance appears to vary between these tests depending upon the population where they are applied. Continued surveillance of AMR in M. haemolytica recovered by nasopharyngeal swab is recommended if monitoring an animal health pathogen is an objective of the surveillance program as results of surveillance using fecal E. coli cannot be extrapolated to this important respiratory pathogen. If surveillance of E. coli was pursued in the same population, study populations could target animals that were culture-positive for M. haemolytica without biasing estimates for AMR in E. coli. Composite pen-floor sampling or sampling of individuals per-rectum could possibly be used interchangeably for monitoring resistance in E. coli.

Publication Type
   Journal article.

<6>
Accession Number
   20133385580
Author
   Muniz, I. M.; Penna, B.; Lilenbaum, W.
Title
   Treating animal bites: susceptibility of staphylococci from oral mucosa of cats.
Source
   Zoonoses and Public Health; 2013. 60(7):504-509. 35 ref.
Publisher
   Wiley-Blackwell
Location of Publisher
   Berlin
Country of Publication
   Germany
Abstract
   Infected wounds determined by cats' bites represent high costs to public health, and their adequate treatment relies on the knowledge of the antimicrobial susceptibility of bacterial agents found in the oral microbiota. Members of the genus Staphylococcus sp. belong to the microbiota of the oral mucosa of cats and are frequently involved in secondary infections of these wounds. This study aimed to evaluate the antimicrobial susceptibility of Staphylococcus species isolated from oral mucosa of cats. Samples were collected from 200 clinically healthy cats and processed by standard bacteriological methods and tested for susceptibility to a panel of 16 antimicrobials. A total of 212 staphylococci isolates were obtained from 141 of the 200 cats (70.5%), and more than one colony was recognized in 53 cases. Coagulase-negative species were most frequently found (89.6%) distributed among Staphylococcus xylosus (50.9%), Staphylococcus felis (27.4%), Staphylococcus simulans (6.1%) and Staphylococcus sciuri (5.2%). Coagulase-positive species (10.4%) were distributed among Staphylococcus aureus (4.7%) and Staphylococcus intermedius group (SIG) (5.7%). Regarding to antimicrobial resistance, 178 isolates (83.9%) were resistant to at least one antimicrobial, and rifampicin showed the best results with 100% of sensitive strains. Conversely, high rates of resistance were observed for penicillin and tetracycline (56.1%). The 212 staphylococci isolates and 30 (14.1%) strains were resistant to methicillin (on the disc susceptibility test) and may be preliminarily considered as methicillin-resistant staphylococci. In conclusion, this study reports important rates of antimicrobial resistance among the species of Staphylococcus isolated from clinical specimens of cats, which must be considered for the treating of cats' bites in humans.

Publication Type
   Journal article.
Objective - To assess antimicrobial resistance among bacteria isolated from dogs and cats admitted to a veterinary teaching hospital (VTH), determine the incidence of acquisition of and frequency of persistent colonization by antimicrobial-resistant organisms among these animals, and identify risk factors associated with these variables. Design - Prospective longitudinal study. Animals - 622 dogs and 92 cats admitted to a VTH and expected to stay >=48 hours. Procedures - Samples were collected with rectal and nasal or oropharyngeal swabs at admission and discharge. Isolates of enterococci, staphylococci, and Escherichia coli were tested for antimicrobial resistance via microbroth dilution methods. A subset of isolates was analyzed with pulsed-field gel electrophoresis and multilocus sequence typing. Significant trends in proportions of organisms with antimicrobial resistance over the 3-year study period were assessed. Results - The proportion of staphylococci with antimicrobial resistance increased, whereas the proportion of E coli with resistance decreased, over time; resistance among enterococci was more variable. For 506 dogs with paired admission and discharge samples, multidrug-resistant (MDR) E coli was acquired by 40 (8%) and methicillin-resistant Staphylococcus aureus (MRSA) was acquired by 7 (1.4%); hospitalization for >3 days was significantly associated with both variables. Most (5/7 isolates) acquired MRSA was of sequence type (ST) 5. Conclusions and Clinical Relevance - Extended hospitalization was associated with increased risk of acquiring MDR E coli or MRSA, although few animals acquired MRSA. It is unclear whether associations were confounded by illness severity or use of infection control measures. Additionally, MRSA of ST5, which has been associated with small animal medicine, was the most commonly acquired MRSA in this study.
Abstract
This investigation provided data on occurrence of antimicrobial resistance in important pathogenic bacteria from dogs, which may be useful for the small animal practitioner. Resistance was high to the compounds that were most often used, but unfortunately, these compounds were broad-spectrum.

Bacterial resistance was tested for susceptibility to eight commonly used antibiotics through Kirby-Bauer disk diffusion technique: using commercially available discs. No resistance was observed to ciprofloxacin, novobiocin, ceftriaxone, cefaclor, cefoxitin, pristinamycin and ampicillin/sulbactam. Drug resistance was observed toward polymyxin B (82.35% of the isolates), lincomycin (61.76% of the isolates), erythromycin (52.94%), tetracycline (50.00%), kanamycin (44.11%), gentamycin (35.29%), doxycycline (32.35%), amoxicillin/clavulanic acid (23.52%), methicillin (5.88%), rifampicin (2.94%) and vancomycin (2.94%), respectively. Data on resistance and usage may form a background for the establishment of a set of recommendations for prudent use of antimicrobials for companion animals.

Publication Type
Journal article.

Accession Number
20133343561

Author
Wasyl, D.; Hoszowski, A.; Zajac, M.; Szulowski, K.

Title
Antimicrobial resistance in commensal Escherichia coli isolated from animals at slaughter.

Source
Frontiers in Microbiology; 2013. 4(August):221. 36 ref.

Publisher
Frontiers Research Foundation

Location of Publisher
Lausanne

Country of Publication
Switzerland

Abstract
Monitoring of antimicrobial resistance in commensal Escherichia coli (N=3430) isolated from slaughtered broilers, laying hens, turkeys, swine, and cattle in Poland has been run between 2009 and 2012. Based on minimal inhibitory concentration (MIC) microbiological resistance to each of 14 tested antimicrobials was found reaching the highest values for tetracycline (43.3%), ampicillin (42.3%), and ciprofloxacin (39.0%) whereas the lowest for colistin (0.9%), cephalosporins (3.6/3.8%), and florfenicol (3.8%). The highest prevalence of resistance was noted in broiler and turkey isolates, whereas it was rare in cattle. That finding along with resistance patterns specific to isolation source might reflect antimicrobial consumption, usage preferences or management practices in specific animals.

Regression analysis has identified changes in prevalence of microbiological resistance and shifts of MIC values. Critically important fluoroquinolone resistance was worrisome in poultry isolates, but did not change over the study period. The difference (4.7%) between resistance to ciprofloxacin and nalidixic acid indicated the scale of plasmid-mediated quinolone resistance. Cephalosporin resistance were found in less than 3.8% of the isolates but an increasing trends were observed in poultry and MIC shift in the ones from cattle. Gentamycine resistance was also increasing in E. coli of turkey and cattle origin although prevalence of streptomycine resistance in laying hens decreased considerably. Simultaneously, decreasing MIC for phenicols observed in cattle and layers isolates as well as tetracycline values in E. coli from laying hens prove that antimicrobial resistance is multivariable phenomenon not only directly related to antimicrobial usage. Further studies should elucidate the scope of commensal E. coli as reservoirs of resistance genes, their spread and possible threats for human and animal health.

Publication Type
Journal article.
The objective of this paper is to analyse in further detail the Danish results of the EFSA baseline studies in slaughter pigs and breeding herds, and compare them with the results obtained in (1) the pre-implementation study that was carried out to establish the initial prevalence values in fattening herds as part of the Danish Salmonella control programme, and (2) the study performed four years later in breeding and finishing herds to obtain information about the prevalence in breeding farms and the status of the finishers after the first years of the National Salmonella Control Programme. In the slaughter pigs Salmonella was detected in a 7.4% of 1218 ileocaecal lymph nodes and on 3.2% of 438 carcasses examined. Among the breeding herds examined by floor faecal or swab samples 122 of 298 (40.9%) were positive in at least one of the ten samples collected. The most prevalent serotypes were Salmonella Typhimurium in finishers and Salmonella Derby in breeding herds while the most prevalent phage types of the S. Typhimurium isolates were DT 12 and DT 120. The antimicrobial resistance analysis yielded a 35.2% of the isolates from the slaughter pigs resistant to one or more antimicrobials while 19.3% were resistant to four or more antimicrobials. A significantly higher percentage of resistance to antimicrobials was found in the S. Typhimurium isolates ( chi <sup>2</sup>=4.72, p=0.029), where 42.9% presented resistance to one or more compounds. In breeding herds, just S. Typhimurium and S. [4,5],12:i - isolates were tested. As many as 56.8% of the S. Typhimurium-like strains positive breeding farms had resistant strains, while 27% had multidrug resistant strains. The distribution of the isolates in regions showed that S. Derby is at present the predominant serotype in breeding farms from most of the regions of the country.

NETHMAP 2013: consumption of antimicrobial agents and antimicrobial resistance among medically important bacteria in the Netherlands.

The information presented in NethMap is based on data from ongoing surveillance systems on the use of antimicrobial agents in human medicine and on the prevalence of resistance to relevant
Salmonella enterica serovar Heidelberg is one of the top three serovars implicated in human infections in Canada. In 2003, the Canadian Integrated Program for Antimicrobial Resistance Surveillance reported antimicrobial resistance (AMR) in S. Heidelberg in Canada. The study objective was to investigate the AMR of S. Heidelberg isolated from poultry in Alberta. We examined 951 S. Heidelberg poultry isolates obtained during 1996 to 2010 and tested against 18 antibiotics using the Sensititre AVIAN1F system. Temporal resistance patterns were analysed using single-level logistic regression models. Continuous variables were included in the multivariable models. Multivariable models were built and variables and interactions were included in these final models. Data were analysed using Stata 11 Intercooled. Ceftiofur resistance ranged annually from 0 to 10.5% and gentamicin resistance ranged annually from 0 to 33.3%; no isolates were enrofloxacin resistant. Resistance to amoxicillin (annual range 0 to 42.6%) varied significantly by time and interaction with commodity type. Meat turkey S. Heidelberg isolates had higher ceftiofur resistance compared with chickens: layers plus layer breeders (odds ratio=22.6, P<0.01) and broiler breeders (odds ratio=9.1, P<0.01). Gentamicin resistance decreased significantly over the study period (odds ratio=0.72 per year, P<0.01). Tetracycline (TET) resistance changed significantly over time (annual range 0 to 39.6%), interacting with poultry commodity type. Meat turkey isolate TET resistance, higher overall than that of chicken, increased throughout the study. All turkey breeder isolates were resistant to TET. In conclusion, this study provides AMR data for S. Heidelberg isolates from the Alberta poultry industry and demonstrated significant trends in resistance, both temporal and between poultry commodities.
Logical use of antibiotics in canine skin disease.

Source

Abstract
Antimicrobial resistance in companion animals is a growing problem, and veterinary practitioners must carefully select antimicrobial treatment. In this article, factors affecting antibiotic selection and common reasons for treatment failure in canine skin disease are discussed. A table of antibiotics licensed for systemic administration in dogs with skin disease is included.

Antimicrobial resistance and prudent drug use for Streptococcus suis.

Source

Abstract
This paper reviews information on antimicrobial resistance patterns and prudent use of antimicrobials to reduce the impact and spread of resistant Streptococcus suis strains. S. suis is an important pathogen in swine, which can cause significant economic loss. Prudent use of antimicrobials for S. suis is essential to preserve the therapeutic efficacy of broad-spectrum antimicrobials and to minimize selection of resistant S. suis strains. Resistance of S. suis to antimicrobials commonly used in swine, including lincosamides, macrolides, sulphonamides, and tetracycline, has been documented worldwide, with resistance in up to 85% of strains. Among antimicrobials examined, resistance of S. suis has been demonstrated to be relatively low for penicillin (0-27%), ampicillin (0.6-23%), and ceftiofur (0-23%). For penicillin, this result may be due in part to the unique mechanism by which resistance is acquired through modifications in the structure of penicillin-binding proteins. Recommendations to control S. suis infection include focused and careful choice and appropriate use of antimicrobials, together with preventive measures intended to improve swine management.
Occurrence of beta-lactamase genes among non-Typhi Salmonella enterica isolated from humans, food animals, and retail meats in the United States and Canada.

Source

Publisher
Mary Ann Liebert, Inc.

Location of Publisher
New Rochelle

Country of Publication
USA

Abstract
Non-Typhi Salmonella cause over 1.7 million cases of gastroenteritis in North America each year, and food-animal products are commonly implicated in human infections. For invasive infections, antimicrobial therapy is indicated. In North America, the antimicrobial susceptibility of Salmonella is monitored by the U.S. National Antimicrobial Resistance Monitoring System (NARMS) and The Canadian Integrated Program for Antimicrobial Resistance Surveillance (CIPARS). In this study, we determined the susceptibility to cephalosporins by broth microdilution among 5,041 non-Typhi Salmonella enterica isolated from food animals, retail meats, and humans. In the United States, 109 (4.6%) of isolates collected from humans, 77 (15.7%) from retail meat, and 140 (10.6%) from food animals displayed decreased susceptibility to cephalosporins (DSC). Among the Canadian retail meat and food animal isolates, 52 (13.0%) and 42 (9.4%) displayed DSC. All isolates displaying DSC were screened for beta-lactamase genes (blaTEM, blaSHV, blaCMY, blaCTX-M, and blaoXA-1) by polymerase chain reaction. At least one beta-lactamase gene was detected in 74/109 (67.9%) isolates collected from humans, and the blaCMY genes were most prevalent (69/109; 63.3%). Similarly, the blaCMY genes predominated among the beta-lactamase-producing isolates collected from retail meats and food animals. Three isolates from humans harbored a blaCTX-M-15 gene. No animal or retail meat isolates harbored a blaCTX-M or blaoXA-1 gene. A blaTEM gene was found in 5 human, 9 retail meat, and 17 animal isolates. Although serotype distributions varied among human, retail meat, and animal sources, overlap in blaCMY-positive serotypes across sample sources supports meat and food-animal sources as reservoirs for human infection.
food, although disparities in resistance were frequently observed between Member States. High resistance levels were recorded to ampicillin, tetracyclines and sulfonamides in Salmonella isolates from humans, while resistance to third-generation cephalosporins and fluoroquinolones remained low. In Salmonella and indicator Escherichia coli isolates from fowl, pigs, cattle and meat thereof, resistance to ampicillin, tetracyclines and sulfonamides was also commonly detected, while resistance to third-generation cephalosporins was low. Moderate to high resistance to (fluoro)quinolones was observed in Salmonella isolates from turkeys, fowl and broiler meat. In Campylobacter isolates from human cases, resistance to ampicillin, ciprofloxacin, nalidixic acid and tetracyclines was high, while resistance to erythromycin was low to moderate. High resistance to ciprofloxacin, nalidixic acid and tetracyclines was observed in Campylobacter isolates from fowl, broiler meat, pigs and cattle, whereas much lower levels were observed for erythromycin and gentamicin. Among the indicator enterococci isolates from animals and food, resistance to tetracyclines and erythromycin was commonly detected. The report also presents for the first time results on multi-resistance and co-resistance to critically important antimicrobials in both human and animal isolates. Very few isolates from animals were co-resistant to critically important antimicrobials.
Antimicrobial resistance is a concern both for animal and human health. Veterinary programmes monitoring resistance of animal and zoonotic pathogens are therefore essential. Various European countries have implemented national surveillance programmes, particularly for zoonotic and commensal bacteria, and the European Food Safety Authority (EFSA) is compiling the data. However, harmonisation is identified as a weakness and an essential need in order to compare data across countries. Comparisons of resistance monitoring data among national programmes are hampered by differences between programmes, such as sampling and testing methodology, and different epidemiological cut-off values or clinical breakpoints. Moreover, only very few valid data are available regarding target pathogens both of farm and companion animals. The European Animal Health Study Centre (CEESA) attempts to fill these gaps. The resistance monitoring programmes of CEESA have been a collaboration of veterinary pharmaceutical companies for over a decade and include two different projects: the European Antimicrobial Susceptibility Surveillance in Animals (EASSA) programme, which collects food-borne bacteria at slaughter from healthy animals, and the pathogen programmes that collect first-intention target pathogens from acutely diseased animals. The latter comprises three subprogrammes: VetPath; MycoPath; and ComPath. All CEESA projects include uniform sample collection and bacterial identification to species level in various European Union (EU) member states. A central laboratory conducts quantitative susceptibility testing to antimicrobial agents either important in human medicine or commonly used in veterinary medicine. This 'methodology harmonisation' allows easy comparisons among EU member states and makes the CEESA programmes invaluable to address food safety and antibiotic efficacy.
Antimicrobial resistance of the mastitis pathogens in dairy cows.

Source

Publisher
Latvia University of Agriculture

Location of Publisher
Jelgava

Country of Publication
Latvia

Abstract
There has been a rapid awareness about multiresistant pathogens in the past 10 years and some bacteria are now resistant to most antimicrobial agents used in veterinary practice. Occurrence of multiresistant bacteria in milk from both dairy cows with high somatic cell count and clinical mastitis were analyzed. Multiple resistance of bacteria isolated from milk depends on bacteria species and is more prominent for coagulase negative staphylococci and Streptococcus agalactiae.

Suggested guidelines for using systemic antimicrobials in bacterial skin infections (2): Antimicrobial choice, treatment regimens and compliance.

Source
Veterinary Record; 2013. 172(6):156-160. many ref.

Publisher
BMJ Publishing Group

Location of Publisher
London

Country of Publication
UK

Abstract
Systemic antimicrobials are critically important in veterinary healthcare, and resistance is a major concern. Antimicrobial stewardship will be important in maintaining clinical efficacy by reducing the development and spread of antimicrobial resistance. Bacterial skin infections are one of the most common reasons for using systemic antimicrobials in dogs and cats. Appropriate management of these infections is, therefore, crucial in any policy for responsible antimicrobial use. The goals of therapy are to confirm that an infection is present, identify the causative bacteria, select the most appropriate antimicrobial, ensure that the infection is treated correctly, and to identify and manage any underlying conditions. This is the second of two articles providing evidence-led guidelines to help practitioners address these issues. The first article (VR, January 19, 2013, vol 172, pp 72-78) discussed the use of clinical signs, cytology and culture in diagnosis. This second article covers the rationale for topical and systemic antimicrobial therapy, including choice of first-, second- and third-line drugs, the dose, duration of therapy, compliance and identification of underlying predisposing conditions. In addition, there is guidance on cases of therapeutic failure and environmental hygiene. These guidelines should help veterinarians avoid the development and propagation of antimicrobial-resistant bacterial strains.
Investigation of antimicrobial resistance and genetic relatedness of staphylococci from milk of cows with mastitis and cowshed environment was the aim of this study. Antimicrobial resistance against 14 antimicrobials were determined by using a disc diffusion method. Genetic similarity between the most frequently isolated species was analysed by PFGE (pulsed-field gel electrophoresis). Haemolytic activity, DNase, protease and esterase production was also investigated. Coagulase-negative Staphylococcus species were isolated from 30.8% of milk samples from cows with mastitis. The most frequently isolated species was Staphylococcus xylosus and yield of these organisms was significantly associated with milk of mastitis cows. S. epidermidis was a predominant penicillin-resistant species. High frequency of resistance to lincomycin was observed among isolates of S. sciuri (54.2%) and S. xylosus (25.9%) from cows with mastitis. PFGE (pulsed-field gel electrophoresis) analysis of 29 Staphylococcus aureus isolates showed the presence of 17 PFGE pulsotypes. Isolates of S. sciuri (n=36) had unique PFGE patterns. Some S. xylosus isolates from milk and milker's hands had the same PFGE pulsotypes, and this observation could indicate that dairyman may be a potential source of the infection. The pulsotype of each of the remaining isolates of S. xylosus suggested that they might have come from common environmental sources; however, these isolates differed in antibiotic resistance pattern or virulence traits. Therefore, knowledge about antibiotic sensitivity pattern and virulence factors of a CNS isolate, besides its genotype, may be informative in tracking the source of the infection.

Abstract

Systemic antimicrobials are critically important in veterinary healthcare and resistance is a major concern. Antimicrobial stewardship will be important in maintaining clinical efficacy by reducing the development and spread of antimicrobial resistance. Bacterial skin infections are one of the most common reasons for using systemic antimicrobials in dogs and cats. Appropriate management of these infections is therefore crucial in any policy for responsible antimicrobial use. The goals of therapy are to confirm that an infection is present, identify the causative bacteria, select the most appropriate antimicrobial, ensure that the infection is treated correctly, and to identify and manage any underlying conditions. This is the first of two articles that will provide evidence-led guidelines to help practitioners address these issues. This article covers diagnosis, including descriptions of the different clinical presentations of surface, superficial and deep bacterial skin infections, how to perform and interpret cytology, and how to best use bacterial culture and sensitivity testing. The second article, to be published in a subsequent issue of Veterinary Record, will discuss therapy, including choice of drug and treatment regimens.

Antibiotic resistance in Salmonella isolated from tegus (Tupinambis spp.).

Abstract

In recent years, an increase in human clinical cases of reptile-associated salmonellosis has been identified, and it has been attributed to the increased popularity of these animals as pets. Limited information is available regarding the distribution of Salmonella spp. serotypes in different reptile species and the antimicrobial resistance patterns of Salmonella spp. isolated from pet reptiles. This article describes the prevalence of Salmonella spp., distribution of serotypes, and antibiotic susceptibility patterns from isolates cultured from cloacal swabs obtained from 14 tegu lizards (Tupinambis spp.). Eighteen strains of Salmonella belonging to different serotypes were obtained from the 14 tegu lizards. Of the 18 Salmonella spp. isolates, 8 (44.4%) were from Salmonella subspecies I, with a majority of isolates belonging to the Eastbourne serotype (3 strains), Nottingham serotype (2 strains), and Brancaster serotype (2 strains), and only 1 belonging to the Apapa serotype. Less common serotypes were detected in 5 isolates, including 2 each belonging to Salmonella subspecies
II and IIIb, respectively, and 1 to Salmonella subspecies Illa. The serotype of 5 other Salmonella isolates could not be determined. All 18 isolates were resistant to at least 6 of the antimicrobial drugs tested. These results confirm the potential zoonotic risk from handling reptiles, suggesting that measures to educate the reptile-owning public are necessary.

<26>
Accession Number
20133028837
Author
Rato, M. G.; Bexiga, R.; Florindo, C.; Cavaco, L. M.; Vilela, C. L.; Santos-Sanches, I.
Title
Antimicrobial resistance and molecular epidemiology of streptococci from bovine mastitis.
Source
Publisher
Elsevier Ltd
Location of Publisher
Oxford
Country of Publication
UK
Abstract
Streptococcus agalactiae (Group B Streptococcus, GBS), Streptococcus dysgalactiae subsp. dysgalactiae (Group C Streptococcus, GCS) and Streptococcus uberis are relevant mastitis pathogens, a highly prevalent and costly disease in dairy industry due to antibiotherapy and loss in milk production. The aims of this study were the evaluation of antimicrobial drug resistance patterns, particularly important for streptococcal mastitis control and the identification of strain molecular features. Antimicrobial resistance was assessed by disk diffusion against amoxicillin-clavulanic acid, cefazolin, cefoperazone, pirlimycin-PRL, rifaximin, streptomycin, chloramphenicol, erythromycin-ERY, gentamicin, tetracycline-TET and vancomycin. Genotypic relationships were identified using pulsed-field gel electrophoresis (PFGE), macrolide and/or tetracycline resistance gene profiling, GBS capsular typing, GBS virulence gene profiling and GBS and S. uberis multi locus sequence typing (MLST). The majority of the isolates were susceptible to all drugs except to aminoglycoside, macrolide, lincosamide and tetracycline. Close to half of the TET resistant isolates have tetO and tetK and almost all ERY-PRL resistant isolates have ermB. A high degree of intra-species polymorphism was found for GCS. The GBS belonged to ST-2, -554, -61, -23 lineages and five new molecular serotypes and human GBS insertion sequences in the cpsE gene were found. Also, GBS of serotype V with scpB and lmb seem to be related with GBS isolates of human origin (same ST-2 and similar PFGE). Overall our results suggested that different therapeutic programs may have been implemented in the different farms and that in most cases clones were herd-specific.

<27>
Accession Number
20133027447
Author
Blondeau, J. M.
Title
Antimicrobial resistance: the mutant prevention concentration.
Source
Cattle Practice; 2012. 20(3):172-174. 18 ref.
Publisher
British Cattle Veterinary Association
Location of Publisher
Quedgeley
Country of Publication
UK
Abstract


This article discusses the virulence of bacterial pathogens; discovery and efficacy of antibiotics; risk factors contributing to the development of antimicrobial resistance; and the principle of mutant prevention concentration to prevent antibiotic resistance and to enhance long term preservation of drugs for clinical use.
Monitoring in primary production, including at slaughter, is pivotal because of the main transmission route, while additional monitoring in food may help with the assessment of consumers’ exposure via this route. A consistent monitoring in broiler flocks, fattening pigs and dairy cattle, as well as in veal calves under 1 year of age and fattening turkey flocks, in those countries where production exceeds 10 million tonnes slaughtered/year, is recommended every third year on a rotating basis. It is proposed that breeding poultry flocks and breeding pigs, as well as meat and raw milk products, are monitored on a voluntary basis. Representative sampling should be made within the framework of the national Salmonella control programmes for the poultry populations targeted, at the slaughterhouse for calves and either on farm or at the slaughterhouse for fattening pigs. Harmonised analytical methodologies for identification, typing and further characterisation of MRSA are proposed. The use of the microdilution method applied to a harmonised set of antimicrobials, and interpreted using EUCAST epidemiological cut-off values for antimicrobial susceptibility testing of MRSA, is recommended. Finally, full support is given to collection and reporting of isolate-based data, in particular to enable analysis of multi-resistance.

Accession Number
20123413368
Author
Cain, C. L.
Title
Antimicrobial resistance in staphylococci in small animals. (Special Issue: Clinical dermatology.)
Source
Publisher
W.B. Saunders
Location of Publisher
Philadelphia
Country of Publication
USA

Accession Number
20123413073
Author
Andreasen, M.; Alban, L.; Dahl, J.; Nielsen, A. C.
Title
Risk-mitigation for antimicrobial resistance in Danish swine herds at a national level.
Source
Publisher
David Publishing Company
Location of Publisher
El Monte
Country of Publication
USA
Abstract
In Denmark, actions to mitigate the risk related to antimicrobial resistance have been put in place continuously. Due to an increase in the consumption of antimicrobials in the Danish pig production further actions were implemented in July 2010. These were: a voluntary ban on use of cephalosporin in Danish swine herds for a 2-year period and a so-called Yellow Card scheme from the DVFA (Danish Veterinary and Food Administration). Farmers with the highest use of antibiotics receive a Yellow Card. In 2010, approximately 10% of Danish herds were above the Yellow Card threshold value. The consumption of antimicrobials in pigs is evaluated as ADD (animal daily doses) per 100 animals over the last 9 months (by age group). Current permit limits for a Yellow Card in ADD/100 animal days are 5.2 (sows and piglets), 28 (weaners), and 8 (finishers). In July 2010, farmers with an antimicrobial use close to these limits were warned by the DVFA, that unless actions were taken to
reduce their antimicrobial use, they would receive a Yellow Card in December 2010. The means are, for instance, restrictions on oral medication usage and supervision from the authorities to which most expenses are to be covered by the farmer. The warning resulted in a decrease in the national consumption to pigs of 12.5% during the last half-year of 2010 compared to the same half-year in 2009. This decrease continued into 2011 where the consumption in January-February was 24.5% lower than for January-February 2010.

<32>
Accession Number
20123361271
Author
Title
DANMAP 2011 - use of antimicrobial agents and occurrence of antimicrobial resistance in bacteria from food animals, food and humans in Denmark.
Source
Publisher
Statens Serum Institut
Location of Publisher
Copenhagen
Country of Publication
Denmark
Abstract
This report describes the annual consumption of antimicrobial agents by animals (pigs, cattle, poultry, aquaculture/fish and companion animals such as pets and horses) and humans and the occurrence of resistance in zoonotic, indicator and animal and human clinical bacteria in Denmark in 2011. Results from the monitoring programme as well as from selected research projects are presented in overview tables and figures. The report also includes a list of abbreviations, explanations of terminology and description of materials and methods. The specific minimum inhibitory concentration (MIC) distributions as well as some detailed tables of antimicrobial consumption in animals and humans are presented in a web annex located at www.danmap.org.

<33>
Accession Number
20123361942
Author
Milani, C.; Corro, M.; Drigo, M.; Rota, A.
Title
Antimicrobial resistance in bacteria from breeding dogs housed in kennels with differing neonatal mortality and use of antibiotics.
Source
Theriogenology; 2012. 78(6):1321-1328. 37 ref.
Publisher
Elsevier
Location of Publisher
New York
Country of Publication
USA
Abstract
This work examines the antimicrobial resistance of potentially pathogenic bacteria (Staphylococcus pseudintermedius, Streptococcus canis, Escherichia coli) found in the vaginal tract in prepartum mammary secretions and postpartum milk of bitches housed in breeding kennels (N=20; 92 bitches). The kennels were divided into three categories: no routine antimicrobial administration around parturition (category 1); routine administration of one antibiotic around parturition (category 2); routine
administration of multiple antimicrobials around parturition (category 3). Bacteriological cultures and antibiotic susceptibility tests were performed on vaginal specimens, prepartum mammary secretions, and postpartum milk. Stillbirths and neonatal deaths were recorded for each whelping and analyzed as "within-litter stillbirths" and "within-litter neonatal deaths" according to kennel category, by Pearson chi <sup>2</sup> test and the Kruskal-Wallis nonparametric test, respectively. The frequency of isolation and antimicrobial resistance of bacteria were analyzed according to kennel category by Pearson chi <sup>2</sup> test. Kennel category was not significantly associated with differing numbers of stillbirths or neonatal death events, nor was the frequency of isolation of potentially pathogenic bacteria in the three kennel categories significantly different. Kennel category 3 had a significantly higher frequency of isolation of multiresistant gram-positive bacterial strains. Our results show that intense administration of antibiotics to breeding bitches does not effectively reduce neonatal mortality; on the contrary, it induces multireistance in potentially pathogenic bacteria. Breeders and veterinarians should be aware of the risk of selecting pathogenic bacteria by uncontrolled treatment in prepartum bitches.

Accession Number 20123337522
Author Lima, L. F. de A.; Lira, A. C.; Coutinho, H. D. M.; Siqueira Junior, J. P. de; Barreto, H. M.
Title Antimicrobial resistance in staphylococci isolated from canine pyoderma.
Source Comunicata Scientiae; 2012. 3(3):181-185. 30 ref.
Publisher Piaui Federal University
Location of Publisher Bom Jesus
Country of Publication Brazil
Abstract This study aimed to determine the frequency as well as the antimicrobial susceptibility profile of staphylococci isolated from canine pyoderma. The isolated strains were identified by biochemical tests and characterized by their susceptibility to antibacterial agents. The coagulase positive specie S. pseudintermedius was the most prevalent (82.4%, 28/34), followed by coagulase negative species S. chromogenes (6.0%, 2/34), S. epidermidis (2.9%, 1/34), S. warneri (2.9%, 1/34), S. sciuri (2.9%, 1/34) and S. haemolyticus (2.9%, 1/34). High rates of resistance to lincomycin, ampicillin, penicillin G and tetracycline were observed, what is probably due to the frequent use of these antibiotics in veterinary practice. A 32.4% percentage of the strains has shown multi-drug resistance, including a S. pseudintermedius strain resistant to oxacillin. All strains were sensitive to gentamycin, amikacin, tobramycin, chloranphenicol, imipenem, cephalothin and vancomycin. These results indicate the occurrence of resistant staphylococci associated with canine pyoderma and point to the need of careful selection of antibiotics based on results of the susceptibility testing, in order to reduce the selection of multiresistant strains.

Accession Number 20123327371
Author Ozawa, M.; Makita, K.; Tamura, Y.; Asai, T.
Title Associations of antimicrobial use with antimicrobial resistance in Campylobacter coli from grow-finish pigs in Japan.
Publisher Elsevier B.V.
To determine associations between antimicrobial use and antimicrobial resistance in Campylobacter coli, 155 isolates were obtained from the feces of apparently healthy grow-finish pigs in Japan. In addition, data on the use of antibiotics collected through the national antimicrobial resistance monitoring system in Japan were used for the analysis. Logistic regression was used to identify risk factors to antimicrobial resistance in C. coli in pigs for the following antimicrobials: ampicillin, dihydrostreptomycin, erythromycin, oxytetracycline, chloramphenicol, and enrofloxacin. The data suggested the involvement of several different mechanisms of resistance selection. The statistical relationships were suggestive of co-selection; use of macrolides was associated with enrofloxacin resistance (OR=2.94; CI<sub>95%</sub>: 0.997, 8.68) and use of tetracyclines was associated with chloramphenicol resistance (OR=2.37; CI<sub>95%</sub>: 1.08, 5.19). The statistical relationships were suggestive of cross-resistance: use of macrolides was associated with erythromycin resistance (OR=9.36; CI<sub>95%</sub>: 2.96, 29.62) and the use of phenicols was associated with chloramphenicol resistance (OR=11.83; CI<sub>95%</sub>: 1.41, 99.44). These data showed that the use of antimicrobials in pigs selects for resistance in C. coli within and between classes of antimicrobials.
warrants increased monitoring. Together with continuous monitoring of antimicrobial usage, management strategies should be regularly assessed and adapted.

Accession Number
20123289505
Author
Title
Prophylactic and metaphylactic antimicrobial use in Belgian fattening pig herds.
Source
Publisher
Elsevier B.V.
Location of Publisher
Amsterdam
Country of Publication
Netherlands
Abstract
The monitoring of antimicrobial use is an essential step to control the selection and spread of antimicrobial resistance. Between January and October 2010 data on prophylactic and metaphylactic antimicrobial use were collected retrospectively on 50 closed or semi-closed pig herds. Ninety-three percent of the group treatments were prophylactic whereas only 7% were metaphylactic. The most frequently used antimicrobials orally applied at group level were colistin (30.7%), amoxicillin (30.0%), trimethoprim-sulfonamides (13.1%), doxycycline (9.9%) and tylosin (8.1%). The most frequently applied injectable antimicrobials were tulathromycin (45.0%), long acting ceftiofur (40.1%) and long acting amoxicillin (8.4%). The treatment incidences (TI) based on the used daily dose pig (UDD<sub>pig</sub> or the actually administered dose per day per kg pig of a drug) for all oral and injectable antimicrobial drugs was on average 200.7 per 1000 pigs at risk per day (min=0, max=699.0), while the TI based on the animal daily dose pig (ADD<sub>pig</sub>) or the national defined average maintenance dose per day per kg pig of a drug used for its main indication) was slightly higher (average=235.8, min=0, max=1322.1). This indicates that in reality fewer pigs were treated with the same amount of antimicrobials than theoretically possible. Injectable products were generally overdosed (79.5%), whereas oral treatments were often underdosed (47.3%). In conclusion, this study shows that prophylactic group treatment was applied in 98% of the visited herds and often includes the use of critically important and broad-spectrum antimicrobials. In Belgium, the guidelines for prudent use of antimicrobials are not yet implemented.

Accession Number
20123270430
Author
Dias, C.; Mota, V.; Martinez-Murcia, A.; Saavedra, M. J.
Title
Antimicrobial resistance patterns of Aeromonas spp. isolated from ornamental fish.
Source
Journal of Aquaculture Research and Development; 2012. 3(3):131. 33 ref.
Publisher
OMICS Publishing Group
Location of Publisher
Los Angeles
Country of Publication
USA
Abstract
The potential risk of occurrence of new diseases associated with the trade of live animals is well known. However, little importance is still given to the problematic of the dissemination of resistance genes that pass along with the animal trade. In this study we aimed to isolate Aeromonas spp. strains from water and skin of ornamental fish and test their resistance to antibiotics. The samples were collected from a national ornamental fish importer, with the intent of obtaining a collection of Aeromonas strains. The identification of the strains was made by gyrB and rpoD gene sequencing. A total of 288 strains grouped in seven different species - Aeromonas veronii, Aeromonas media, Aeromonas jandaei, Aeromonas hydrophila, Aeromonas caviae, Aeromonas cuniculicola, Aeromonas aquariorum, were isolated. The susceptibility profile was determined for 28 antibiotics commonly used. All the strains presented multi-resistance to the tested antibiotics. The antibiotic susceptibility profile to tetracycline, ticarcillin, carbenicillin, ampicillin and erythromycin revealed resistance levels of more than 80%. Few strains resistant to aztreonam and imipenem were identified. On the other hand, all were sensitive to cefotaxime and ceftiapime. The results show that these Aeromonas spp. strains are potentially reservoirs of antibiotic resistance genes.

Accession Number
20123270292
Author
Title
Antimicrobial resistance, virulence profiles, and phylogenetic groups of fecal Escherichia coli isolates: a comparative analysis between dogs and their owners in Japan.
Source
Comparative Immunology, Microbiology & Infectious Diseases; 2012. 35(2):139-144.
Publisher
Elsevier Ltd
Location of Publisher
Oxford
Country of Publication
UK
Abstract
In this study, fecal Escherichia coli isolates (n=188) from 34 dog-owner pairs and 26 healthy control humans (2 isolates per individual) were tested for susceptibility to 6 antimicrobials and screened for virulence genes. Genetic diversity between canine and owner isolates was evaluated by pulsed-field gel electrophoresis (PFGE). Canine isolates exhibited significantly different rates of resistance to four and two antimicrobials, compared to control and owner isolates, respectively. Of the genes examined, the prevalence of sfa, hly, and cnf genes in canine isolates were higher than in control isolates, but not than in owner isolates. These results suggest that characteristics of owner isolates are somewhat similar to canine isolates, compared to isolates from non-dog owners. In addition, PFGE analysis revealed that transfer of E. coli between owners and their dogs had occurred within 3/34 (8.8%) households. Considering the effects of dog ownership on the population of E. coli isolates from owners, further epidemiological studies are required.

Accession Number
20123261408
Author
Title
Antimicrobial resistance profiles of common mastitis pathogens on Canadian dairy farms.
Source
Publisher
Elsevier Inc.
Monitoring of antimicrobial resistance (AMR) in bacteria has clinical and public health significance. The present study determined prevalence of AMR in common mastitis pathogens Staphylococcus aureus, including methicillin-resistant Staph. aureus (MRSA; n=1,810), Escherichia coli (n=394), and Klebsiella species (n=139), including extended-spectrum beta-lactamase (ESBL)-producing E. coli and Klebsiella species, isolated from milk samples on 89 dairy farms in 6 Canadian provinces. Minimum inhibitory concentrations (MIC) were determined using the Sensititer bovine mastitis plate (Trek Diagnostic Systems Inc., Cleveland, OH) and a National Antimicrobial Resistance Monitoring System gram-negative panel containing antimicrobials commonly used for mastitis treatment and control. Denim blue chromogenic agar and real-time PCR were used to screen and confirm MRSA, respectively. Resistance proportion estimates ranged from 0% for cephalothin and oxacillin to 8.8% for penicillin in Staph. aureus isolates, and 15% of the resistant Staph. aureus isolates were multidrug resistant. One MRSA isolate was confirmed (prevalence: 0.05%). Resistance proportion estimates ranged from 0% for ceftriaxone and ciprofloxacin to 14.8% for tetracycline in E. coli, and 0% for amikacin, cefotiofur, ciprofloxacin, and nalidixic acid to 18.6% for tetracycline in Klebsiella species isolates. Further, 62.8 and 55% of the resistant E. coli and Klebsiella species isolates were multidrug resistant, respectively. Resistance to >5 and >2 antimicrobials was most common in E. coli and Klebsiella species isolates, respectively, and no ESBL producers were found. Prevalence of AMR in bovine mastitis pathogens was low. Most gram-negative udder pathogens were multidrug resistant; MRSA was rarely found, and ESBL E. coli and Klebsiella species isolates were absent in Canadian milk samples.

Abstract

Factors associated with methicillin-resistant versus methicillin-susceptible Staphylococcus pseudintermedius infection in dogs.

Objective - To compare methicillin-resistant Staphylococcus pseudintermedius (MRSP) and methicillin-susceptible S pseudintermedius (MSSP) infections in dogs. Design - Multicenter case-control study. Animals - Dogs with MRSP infections were matched, by hospital, with 2 MSSP controls, with the infections occurring immediately before and after the case infection. Procedures - Signalment, historical, clinical, treatment, and outcome data were documented. Conditional logistic regression was performed. A manual stepwise backward elimination procedure was used to build the multivariable model. Results - 56 case and 112 control dogs were enrolled. Pyoderma was the most common infection type in both groups. In the final multivariable model, systemic administration of antimicrobials within 30 days prior to infection was significantly associated with an MRSP versus an MSSP infection (OR, 9.9; 95% confidence interval, 3.59 to 27.53). Conclusions and Clinical Relevance - The association of prior antimicrobial administration and MRSP infection indicated the potential impact of routine antimicrobial use in veterinary medicine on antimicrobial resistance and the need for prudent use of these important drugs. Mortality rate was not significantly different between MRSP and MSSP infections; the lack of a significant difference suggested that MRSP was inherently no more virulent.
than MSSP, provided the infection was properly diagnosed and appropriate treatment was started. Basic concepts such as prudent antimicrobial use and early diagnosis through timely submission of appropriate culture specimens therefore can be important measures to try to reduce the impact of this pathogen.

<41>
Accession Number 20123180137
Author Scott, L.; Menzies, P.; Reid-Smith, R. J.; Avery, B. P.; McEwen, S. A.; Moon, C. S.; Berke, O.
Title Antimicrobial resistance in Campylobacter spp. isolated from Ontario sheep flocks and associations between antimicrobial use and antimicrobial resistance.
Publisher Wiley-Blackwell
Location of Publisher Berlin
Country of Publication Germany
Abstract The objectives of this study were to determine the prevalence of antimicrobial resistance (AMR) in faecal Campylobacter spp. from lambs and adult sheep and associations between antimicrobial use (AMU) and AMR. A total of 275 faecal samples collected during initial and final visits from 51 sheep flocks, including one feedlot, across southern Ontario were tested for the presence of Campylobacter spp. Campylobacter jejuni was detected in 52% (143/275) of the faecal samples, Campylobacter coli in 7% (19/275), Campylobacter lari in 1% (2/275) and 2% (4/275) were non-specified Campylobacter. Broth microdilution was used to test antimicrobial susceptibility of 162 isolates to nine antimicrobials. Campylobacter jejuni isolates (n=142) were resistant to tetracycline (39%), ciprofloxacin (4%), nalidixic acid (4%) and telithromycin (1%). C. coli isolates (n=19) were resistant to tetracycline (74%), and azithromycin, clindamycin, erythromycin, and telithromycin (5%). The C. lari isolate displayed resistance to nalidixic acid. No statistically significant associations were found between AMU and AMR during multivariate modelling in this study.

<42>
Accession Number 20113184562
Author Gay, E.; Chazel, M.; Jouy, E.; Haenni, M.; Calavas, D.; Madec, J. Y.
Title Surveillance of resistance to beta-lactams in Escherichia coli: results from the Resapath surveillance network in France.
Publisher Association pour l'Etude de l'Epidemiologie des Maladies Animales
Location of Publisher Maisons-Alfort
Country of Publication France
Abstract The Resapath is the French surveillance network for antimicrobial resistance in pathogenic bacteria of animal origin created by Ansés in 2000. We analysed the Resapath findings about the resistance of Escherichia coli - the most common bacteria isolated from diseased food-producing animals - to beta-lactams - an antimicrobial class of major importance for both human and animal health - for the period 2006 to 2009. Resistance to amoxicillin is high in food-producing animals (45 to 77%), even if the
The potential public and animal health impact of antimicrobial use and resistance in food animals is a contentious issue for industry, producers and veterinarians. To build collaboration in the development and implementation of a farm-based surveillance system that protects the biosecurity and confidentiality of data providers requires extensive consultation and transparency. Taking this approach, the CIPARS Farm program developed as a national network of volunteer sentinel swine veterinarians and producers that provides trend data on antimicrobial use and resistance. These data contribute to related animal and public health policies in Canada.
commonly prescribed in a scenario about canine pyoderma. In one scenario, fluoroquinolones and 3rd generation cephalosporins accounted for 10% and 13% of prescriptions respectively. Five percent of all prescriptions were under the recommended dose and 20% were over the recommended dose. Overall, 2.3% of prescriptions were not licensed for use in dogs or cats in the UK. Associations between the use of various antimicrobial drugs and independent variables were analysed using multivariable logistic regression models. Off-license prescriptions and inaccurate dosing of antimicrobials by small-animal clinicians in the UK appears to occur. Antimicrobial use guidelines are rare in small animal practice. The introduction of such guidelines has been shown to lead to more appropriate use of antimicrobials and is therefore recommended.

<46>
Accession Number
20123137283
Author
Argyle, S. A.
Title
Appropriate use of antibiotics: local and topical treatments.
Source
Veterinary Times; 2012. 42(15):8...11. 11 ref.
Publisher
Veterinary Business Development Ltd
Location of Publisher
Peterborough
Country of Publication
UK
Abstract
This article primarily focuses on the issue of antimicrobial resistance in the context of small animal use. The Way in which resistance develops is briefly described and then the main considerations and guidelines are summarised to identify the requirements for “good antimicrobial prescribing practice”. The importance, but also the limitations, of culture and sensitivity are identified, together with the importance of having a good working knowledge of the spectrum of activity and pharmacokinetics of the antimicrobials. The relationship between promotion of resistance and safety and efficacy is discussed. The main sources for additional information are identified. Topical and local use of antimicrobials is specifically discussed in terms of the advantages and disadvantages of this route of antimicrobial administration. Particular attention is drawn to the potential challenges faced when choosing to use unlicensed preparations.

<47>
Accession Number
20123133305
Author
Saini, V.; McClure, J. T.; Scholl, D. T.; DeVries, T. J.; Barkema, H. W.
Title
Herd-level association between antimicrobial use and antimicrobial resistance in bovine mastitis Staphylococcus aureus isolates on Canadian dairy farms.
Source
Publisher
Elsevier Inc.
Location of Publisher
Philadelphia
Country of Publication
USA
Abstract
Surveillance of antimicrobial use and resistance is needed to manage antimicrobial resistance in bacteria. In this study, data were collected on antimicrobial use and resistance in Staphylococcus aureus (n=562), isolated from intramammary infections and (sub)clinical mastitis cases on 89 dairy
farms in 4 regions of Canada [Alberta, Ontario, Quebec, and the Maritime Provinces (Prince Edward Island, Nova Scotia, and New Brunswick)]. Dairy producers were asked to deposit empty drug containers into specially provided receptacles, and antimicrobial drug use rate was calculated to quantify antimicrobial use. Minimum inhibitory concentrations were determined using the Sensititer bovine mastitis plate system (TREK Diagnostic Systems Inc., Cleveland, OH), containing antimicrobials commonly used for mastitis treatment and control. Multivariable logistic regression models were built to determine herd-level risk factors of penicillin, ampicillin, pirlimycin, penicillin-novobiocin combination, tetracycline and sulfadimethoxine resistance in Staph. aureus isolates. Intramammary administration of the penicillin-novobiocin combination for dry cow therapy was associated with penicillin and ampicillin resistance [odds ratio (OR): 2.17 and 3.10, respectively]. Systemic administration of penicillin was associated with penicillin resistance (OR: 1.63). Intramammary administration of pirlimycin for lactating cow mastitis treatment was associated with pirlimycin resistance as well (OR: 2.07). Average herd parity was associated with ampicillin and tetracycline resistance (OR: 3.88 and 0.02, respectively). Average herd size was also associated with tetracycline resistance (OR: 1.02). Dairy herds in the Maritime region had higher odds of penicillin and lower odds of ampicillin resistance than dairy herds in Quebec (OR: 2.18 and 0.19, respectively). Alberta dairy herds had lower odds of ampicillin and sulfadimethoxine resistance than dairy herds in Quebec (OR: 0.04 and 0.08, respectively). Ontario dairy herds had lower odds of tetracycline and sulfadimethoxine resistance than dairy herds in Quebec (OR: 0.05 and 0.33, respectively). Herd-level use of certain antimicrobials administered for mastitis treatment and control, such as intramammary penicillin and pirlimycin as well as systemically administered penicillin and florfenicol, was positively associated with antimicrobial resistance in bovine mastitis pathogens in the field conditions. Differences in antimicrobial resistance outcomes across 4 regions of Canada were observed.

Lost sweet 49
Accession Number
20123133064
Author
Broens, E. M.; Graat, E. A. M.; Giessen, A. W. van de; Broekhuizen-Stins, M. J.; Jong, M. C. M. de
Title
Quantification of transmission of livestock-associated methicillin resistant Staphylococcus aureus in pigs.
Source
Veterinary Microbiology; 2012. 155(2/4):381-388. 28 ref.
Publisher
Elsevier Ltd
Location of Publisher
Oxford
Country of Publication
UK
Abstract
Antimicrobial resistance in pigs becomes a public health issue when resistant organisms transfer from pigs to humans. Pigs are a large reservoir for livestock-associated (LA-)MRSA and people in contact with pigs are at risk for infection with LA-MRSA. Transmission and persistence of LA-MRSA within a pig population contributes to the maintenance of this zoonotic reservoir. Current knowledge on colonization and transmission of LA-MRSA in pigs is limited and mainly based on observational field surveys. Two experiments were performed to colonize pigs and quantify transmission of LA-MRSA between pigs. In the first experiment, colonization of six-week old piglets failed after intranasal inoculation, confirming the complexity of MRSA-colonization. In the second experiment, naive pigs got colonized after exposure to orally inoculated pigs. Subsequently, these contact-infected pigs transmitted MRSA to a new group of naive pigs. The reproduction ratio, R<sub>0</sub>, was estimated with a SIS-model to quantify transmission between the first and second contact pigs as this resembles more the natural transmission. Two scenarios were evaluated, with different assumptions regarding infection status of individual pigs. R<sub>0</sub> varied between 3.7 and 4.3 and was significantly above 1, indicating a high probability of persistence of LA-MRSA, even without antimicrobial use.
Impact of routine antimicrobial therapy on canine fecal Escherichia coli antimicrobial resistance: a pilot study.

Abstract

Increased prevalence of antimicrobial resistance in various bacterial species from pet animals has been reported in the United States and the United Kingdom, with resistance generally associated with antimicrobial therapy. Increased prevalence of antimicrobial resistance in various bacterial species from pet animals has been reported in the United States and the United Kingdom, with resistance generally associated with antimicrobial therapy. This study was performed in order to investigate the feasibility of a larger scale study that would focus on the impact of antimicrobial therapy on the fecal flora of normal dogs. Either amoxicillin or enrofloxacin administered at recommended dosing regimens is associated with rapid development of high level antimicrobial resistance to that drug by the majority of fecal coliform, and particularly E. coli. Resistance associated with amoxicillin resolved when therapy is discontinued. In contrast, resistance to enrofloxacin persisted.

Human health risks associated with antimicrobial use in animals.

Abstract

This chapter discusses the association between antimicrobial use and occurrence of antimicrobial resistance in animals, foodborne, direct and environmental transmission of antimicrobial resistance from animals to humans and consequences of antimicrobial resistance in human infections with zoonotic bacteria.
Surveillance of bacterial contamination in small animal veterinary hospitals with special focus on antimicrobial resistance and virulence traits of enterococci.

Source
Publisher
American Veterinary Medical Association
Location of Publisher
Schaumburg
Country of Publication
USA
Abstract
Objective - To determine the prevalence of bacterial contamination on 4 surfaces of 4 types of standard equipment in small animal veterinary hospitals. Design - Surveillance study. Sample - 10 small animal veterinary hospitals. Procedures - Each hospital was visited 3 times at 4-month intervals; at each visit, a cage door, stethoscope, rectal thermometer, and mouth gag were swabbed. Swab samples were each plated onto media for culture of enterococci and organisms in the family Enterobacteriaceae. Enterococci were identified via a species-specific PCR assay and sodA gene sequencing; species of Enterobacteriaceae were identified with a biochemical test kit. Antimicrobial susceptibility was assessed via the disk diffusion method. Enterococci were screened for virulence traits and genotyped to assess clonality. Results - Among the 10 hospitals, enterococci were isolated from cage doors in 7, from stethoscopes in 7, from thermometers in 6, and from mouth gags in 1; contamination with species of Enterobacteriaceae was rare. Enterococci were mainly represented by Enterococcus faecium (35.4%), Enterococcus faecalis (33.2%), and Enterococcus hirae (28.3%). Antimicrobial resistance was common in E. faecium, whereas virulence traits were present in 99% of E. faecalis isolates but not in E. faecium isolates. Clonal multidrug-resistant E. faecium was isolated from several surfaces at 1 hospital over multiple visits, whereas sporadic nonclonal contamination was detected in other hospitals. Conclusions and Clinical Relevance - Contamination of surfaces in small animal veterinary hospitals with multidrug-resistant enterococci is a potential concern for pets and humans contacting these surfaces. Implementing precautions to minimize enterococcal contamination on these surfaces is recommended.
resistance to cefoxitin (8.0%) and gentamicin (1.8%) were quite rare. Fifteen percent of isolates were resistant to one antibiotic, simultaneous resistance to two, three, four and five antibiotics was confirmed in 22.1%, 23.9%, 21.2% and 13.3% of isolates, respectively. Except for two coagulase-positive Staphylococcus aureus isolates (1.8%), seven species of coagulase-negative staphylococci were identified using the MALDI BioTyper (TM) system as follows: Staphylococcus warneri (45.1%), Staphylococcus epidermidis (21.2%), Staphylococcus pasteuri (13.3%), Staphylococcus xylosus (8.0%), Staphylococcus capitis (7.1%), Staphylococcus haemolyticus (1.8%) and Staphylococcus cohnii ssp. cohnii (1.8%).
Canada. Methods: From October 2005 to May 2006, 138 dogs from 84 Ontario households were recruited to participate in a cross-sectional study. Five consecutive daily faecal samples were collected from each dog and cultured for Salmonella spp. and E. coli. A panel of 15 antimicrobials from seven antimicrobial classes was used for susceptibility testing. Results: E. coli and Salmonella spp. were recovered from 96.4% and 23.2% of dogs, respectively. In total, 515 bacterial isolates from 136 dogs from 83 households were sent for antimicrobial susceptibility testing with 80.4% of isolates being pan-susceptible. The most common resistance pattern was to amoxicillin/clavulanic acid, ampicillin, cefoxitin, ceftriaxone and cefotaxime, present in 13.3% of Salmonella isolates and 1.3% of E. coli isolates. Fifty-eight of the isolates were resistant to two or more drug classes, with 70.7% and 29.3% being E. coli and Salmonella, respectively. Based on multilevel logistic regression, the odds of resistance were greater in E. coli than Salmonella [odds ratio=3.2; 95% confidence interval (CI)=1.22-8.43]. Agreement in resistance between E. coli and Salmonella isolates from the same dog was low [prevalence-adjusted, bias-adjusted kappa (PABAK)=0.38; 95% CI=0.30-0.46]. Conclusions: Pet dogs are a potential household source of antimicrobial-resistant Salmonella spp. and E. coli. However, extrapolating the epidemiology of antimicrobial resistance in pathogens, like Salmonella, from E. coli should be done with caution.