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Antimicrobial resistance of proteus isolates from poultry

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ABSTRACT

Proteus is the second most important bacteria in urinary infection in human. This bacterium could be found frequent in intestinal tract of poultry. In slaughter house the contamination of poultry carcasses with intestinal flora is normal when the poultry carcasses are put in the chiller for washing and cooling. In the other hand different antibiotics are used without antibiogram test in different ages in poultry houses for treatment and prevention of diseases. The role of animal for reservoir of resistance bacteria is very important. In this study 54 proteus isolates were screened for antimicrobial susceptibility to 13 selected antimicrobial agents. No the proteus isolates in this study were resistant to gentamycin. 96% of the isolates were resistant to at least to two or more antibiotics. One isolates exhibiting resistance to ten antibiotics and three isolates resistance to nine and five isolates resistance to seven antibiotics. The results showed that chicken could be a source of multiple antimicrobial-resistant proteus and this bacteria can be a worldwide problem both for veterinary and public health sectors.

Key words: proteus, poultry, antimicrobial-resistant

INTRODUCTION

Proteus is a gram negative bacterium and has been considered as one of the most frequent bacteria in normal flora in human and animal's intestine. This bacteria is one the most pathogens in urinary infection in human. The role of animal for reservoir of this pathogen is very important because intestinal tract of poultry could be a source of this bacterium and mishandling of poultry product in slaughter house and raw poultry carcasses is one of the most frequent causes of human infection by proteus species [1, 2].

Antimicrobials agents in food animals are used for treating or prevention of disease and also to promote growth. In animal such as poultry and fish mass medication it is often more efficient to treat entire groups by medicating feed or water [3]. Withdrawal times for drugs that used for animal are necessary to prevent harmful drug residues in meat, milk, and eggs. Meat and meat products that contain antimicrobial residues exceeding a certain level at the end of the withdrawal period may be banned from human consumption [4, 5] but unfortunately in Iran there is no strategic way for this. The emergence of antimicrobial-resistant proteus is associated with the use of antibiotics in animals raised for foods, particularly those of animal origin [6, 7]. This study was undertaken to estimate the antimicrobial resistance of proteus isolated from chicken intestine before they slaughtered.

MATERIALS AND METHODS

From February 2012 to September 2012 a total of 200 chicken intestines from 40 randomly farms (the farms were located in different part of Ilam and Kermanshah province) were sampled for the presence of Gram negative bacteria. Five samples were taken from the cloace with a sterile cotton swab from each flocks in slaughter houses before the chicken were slaughtered. The samples dipped in sterile Selenite-F Broth and incubated over the night.

After 24 hours the samples were inoculated in McConkey agar. The colonies were purified and biochemically characterized as proteus by standard biochemical methods. The characters included morphology on Gram's staining, motility, methyl red test, Vogues-Proskauer test, citrate utilization, catalase, indole and urease production and sugar fermentation test. Finally 54 proteus isolates from different flocks were selected for their susceptibility to 13 selected antimicrobial agents' (ciprofloxacin, doxycycline, cefotaxime, oxytetracycline, norfloxacin, kanamycin, nalidixic acid, amikacin, gentamycin, imipenem, piperacillin, ampicillin, ceftriaxone) by the disk diffusion test. Antimicrobial susceptibility testing was determined by the Kirby-Bauer disc diffusion method according to CLSI recommendations [8] and the antibiotic disk were *MASTDISCS*TM.

RESULTS

Fifty two (96%) isolates displayed resistance to at least to two or more antibiotics. Among multidrug-resistant isolates, resistance to nalidixic acid (93%), doxycycline (91%) and oxy tetracycline (89%) was most often observed. The isolates were lesser resistance to norfloxacin (24%), ampicillin (22%), ceftriaxone (22.4%) and amikacin (24%). All the proteus isolates in this study were susceptible to gentamycin. The one isolates exhibiting resistance to ten antibiotics and three isolates resistance to nine and five isolates resistance to seven antibiotics. 52, 45 and 31 percent of the isolates were resistant to cefotaxime, ciprofloxacin and piperacillin respectively.

DISCUSSION

Proteus is one of the more frequent bacteria in intestinal tract in human and animals. Kolar et al., 2005 [9] isolated 127 *P. mirabilis* strains out of 300 samples (near to 50%) of cloacal swabs from healthy layer hens this is agree with our study. In human proteus is the second most important bacteria in urinary infection. There are a lot of studies on antimicrobial sensitivity on proteus in human but in poultry no more data were founded [10, 11, 12]. The role of animal for transmission of this pathogen is very important because in slaughter house the contamination of poultry carcasses with intestinal flora is normal when the poultry carcasses are put in the chiller for washing and cooling [13, 14]. In veterinary medicine, different antibiotics are used in the treatment of farm animals. Unfortunately a lot of antibiotics are used without antibiogram test by farmer in different ages in poultry houses. The high level of antibiotic resistance of proteus isolates in this research is an indication of unrestrained and continuous use of antibiotics in animals. In the other hand the results showed the possible significance of chicken as a source of multiple antimicrobial-resistant proteus and this bacteria can be a worldwide problem both for veterinary and public health sectors.

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