



## INAPPROPRIATE ANTIBIOTICS USE IN OUT PATIENT CARE: A REVIEW ON PREVENTION AND ROLE OF PHARMACIST

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### ARTICLE INFO

### ABSTRACT

#### Key Words

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Antibiotics are the key drugs for the treatment of infectious disease and are the commonly prescribed drug. The over use or misuse of these antibiotics can lead to antibiotic resistance. Antibiotic resistance will remain a major threat in our present world. It leads to higher medical costs, high dose instead of small dose, increased length of hospital stay, and increased mortality. So we need a solution to overcome or prevention of antibiotic resistance. Pharmacist plays an important role in the health care team and promotes the quality of life of patient because they are considered as medicine expertise and should know the up to date knowledge about antibiotics and their clinical action. The aim of this paper to highlight the prevention and pharmacist role in the inappropriate antibiotic use in outpatient care.

### INTRODUCTION:

Antibiotics are medicines used to treat and prevent the infections caused by bacteria. Antibiotics have been around since 1928, the Alexander Fleming invented Penicillin<sup>[1]</sup>, the first compound with antibiotic potency, main aim of these drug to treat bacterial infections. Then the year 1932 antibiotic sulfonamide was discovered, it proved to be more effective against the infections like pneumonia and UTI. The main mechanism of antibiotics, it is a broad spectrum and killing the infective microorganisms. Many of the antibiotics are unnecessarily prescribed for viral infection such as common cold, flu. Thus using antibiotics to treat these viral infection is considered

misuse or overuse of antibiotics. The antibiotics are the second leading prescribed drug for treating infectious disease. Their over use or misuse of these drugs can lead to the risk of antibiotic resistance<sup>[2]</sup>. Antibiotic resistance occurs when bacteria change in response to use of these medicines. Antibiotic resistance will lead to increased length of hospital stay, higher cost of medicines and increased mortality<sup>[3]</sup>. Other factors considered to be resistance include incorrect diagnosis, unnecessary prescription, self prescription or self medication<sup>[4]</sup>, use of antibiotics as livestock food additives and use of meat that comes from animals treated with

antibiotics<sup>[5]</sup>. Antibiotics are over use/over prescribed in outpatient care because prescribers prescribe drug before culture sensitivity and other laboratory settings. Resistance can be reduced by reducing the use of antibiotics.

### **Risk associated with over use/misuse of antibiotics:**

- ❖ Increase the condition of antimicrobial resistance
- ❖ Increase the chance of more severe disease
- ❖ Increase the duration of disease
- ❖ Increase over all health care cost
- ❖ Increase risk and complication
- ❖ Increase morality rate
- ❖ Increase the chance of adverse drug reaction
- ❖ Increase the length of hospital stay

### **Causes of antibiotic resistance**

#### **Over use**

- The main reason overuse/misuse is due to patient administer the antibiotic without prescription.
- Condition in which antibiotic are over use
- The condition of viral respiratory tract infection in children should not be used with antibiotics. If it is bacterial infection treated with antibiotics.
- Viral conjunctivitis should not be treated with antibiotic.
- The condition like common cold, flu should not be treated with antibiotics, it is a viral infection.
- Eczema should not be treated with oral antibiotics, because it is a dry skin condition treated with lotion<sup>[6]</sup>

**Inappropriate prescribing:** A reduction in antibiotic use will reduce resistance. Inappropriate prescribing can also

cause promotion of resistant bacteria. Some of the studies shown that antibiotic is needed but, choice of antibiotic, duration of therapy and its dose was incorrect in approximately 50% cases<sup>[7]</sup>. Incorrectly prescribed antibiotics, patient didn't get the therapeutic effect and also cause potential complication of antibiotic therapy<sup>[8]</sup>. Antibiotic resistance can even cause genetic alterations. Prescribe only antibiotics who are expected to benefit from the treatment.

**Use of antibiotics in agriculture purpose and live stock:** Antibiotics are used in agriculture purpose because promote growth and prevent disease<sup>[9]</sup>. Antibiotics are widely used in both developing and developed countries. Some of the antibiotics like tetracycline are used in fruits as pesticides. It is also injected in livestock because for improving health of animals and produce large yields. When the time we consume animal meat as food, transfer resistant bacteria to humans and produce antibiotic resistance to humans.

**Prevention and control of antibiotics resistance:** Steps can be taken at all levels of society to prevent the antibiotic resistance

#### **Individual**

Take as Advised, Take antibiotics as prescribed by Doctor. It is necessary to take them in recommended dose, frequency and duration, follows correct instructions from prescribers eg: if it is take on an empty stomach or after food for the correct action of the drug, Tell your Doctor, Talk to your doctor if you are, Allergic to any medicines, Pregnant or breast feeding, Having Liver or Kidney problem, This will help the doctor to select the drug which are suitable for you. Keeping them safe, Keep antibiotics away from children and away from heat and sunlight, Never demand antibiotics. Never share or use others antibiotics<sup>[10]</sup> Prevent the

infections by avoid the close contacts of sick patients, wash the hand regularly, and prepare the food hygienically.

**Health professionals:** Prescribe antibiotics only when they are needed, and for the condition, Give the correct information to patients how to take the antibiotics eg: if it is taken before food or after food, Prevent the infection by instruments used by Doctors should be clean, Advice vaccination for prevention of disease, Prescribe antibiotics after culture sensitivity test and other laboratory tests, Prescribe antibiotics for only bacterial infection, not viral infection such as common cold<sup>[11]</sup>

**Agriculture purpose:** Use antibiotics only prescribed by veterinary doctor, Don't use antibiotic for growth purpose and prevention of disease for healthy animals. Take Vaccination, Maintain hygiene and prevent infection

**Directions for proper use of antibiotics:**  
Tips for proper use of antibiotics

**Complete the full course of the antibiotic-**  
It is important to take antibiotic as prescribed by the Doctor. Never stop the course before if you feel better, drug may not kill the bacteria. You may become infected again and remaining bacteria may become resistant to the antibiotic that you have to be taken, so high dose of antibiotic is needed.

**Do not skip doses-**Antibiotics are required to be used at regular time interval for the entire duration of treatment to cure the infection. Skipping dose is not advisable. If you missed a dose take as soon as you remember, do not take double dose.

**Do not self-medicate:** Selection of antibiotics as well as dosages and duration depends on the infection. So don't self-medicate

**Do not save antibiotic:** Never take leftover antibiotics because this medicine is not suitable for present condition, taking the wrong medicine can delay getting the appropriate treatment and may allow your condition to worsen.

**Do not use expired medicines:** Don't use antibiotic after the expiry date. In general antibiotics have shorter shelf life than others

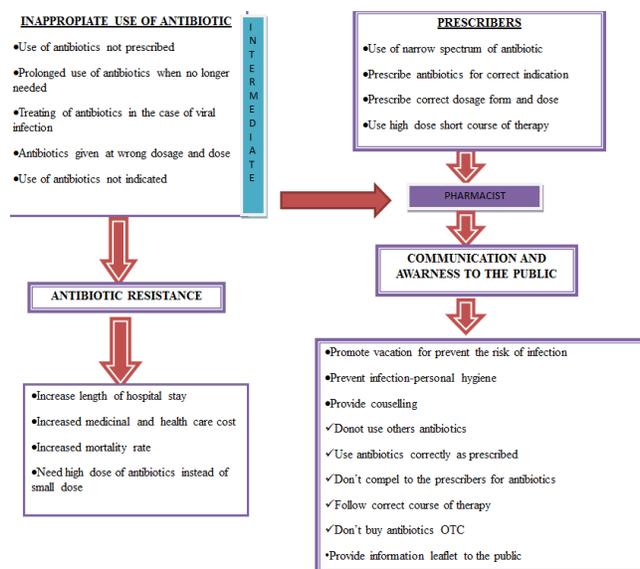
#### **Role of pharmacist in inappropriate use of antibiotics in outpatient care**

Pharmacist plays an important role in the healthcare team and promotes the quality of life of patient because they are considered as medicine expertise and should know the up-to-date knowledge about antibiotics and their clinical action. The role of pharmacist includes communication and educate the patients the importance of antibiotics.

- To check the prescription is rational
- Check that each antibiotic has an infection
- Check the dose of antibiotics based on patient age, weight
- Counselling and advice to the patients include,
  - ✓ Adverse effects of antibiotic and consequence about incomplete dosage
  - ✓ Complete full course of antibiotics. Do not ask prescribers for antibiotics
  - ✓ Use antibiotics as prescribed
  - ✓ Do not share antibiotics
  - ✓ Never save antibiotics for later, Do not skip the antibiotics, Do not buy antibiotics over the counter

Advice on self-limiting infections against bacterial and viral disease, Duration of symptoms, Symptoms which require medical attention.

we can overcome the problem by prescribing them in a rational manner.



Promote vaccination –This will help the people for reduce and prevent the primary infection.This will help reduce the use of antibiotics<sup>[12],[13]</sup>Education-The most important role of pharmacist is educator. Provide information about the antibiotic resistance and appropriate use of antibiotics. Pharmacist educating the public about the infection control practices such as personal hygiene,hand hygiene,immunization<sup>[14],[15]</sup>.Provide information leaflet

### CONCLUSION:

Irrational prescribing of antibiotics may cause severe adverse effects in humans. Antibiotic resistance is one of the important threats in the present world. Improving the outpatient prescribing practices will minimizing the antibiotic resistance. Reducing the use of antibiotic will also reduce the resistance. Pharmacist play a important role in working with pharmacist and prescribers to reduce it. As pharmacist

### REFERENCES:

1. Sengupta S, Chattopadhyay MK, Grossart HP.The multifaceted roles of antiotics and antibiotic resistance in nature.Front Microbiol. 2013;4:47
2. Ventola CL.The antibiotic resistance crisis: Part1:causes and threats.PT.2015;40(4):277-83
3. Cosgrove SE.The relationship between antimicrobial resistance & patient outcomes:mortality,length of hospital stay and health care costs.Clin infect Dis.2006;42 suppl 2:582-9
4. Larson E .Community factors in the development of antibiotic resistance.Annual Review of Public Health.2007 :28 (1):435-478
5. Gov Track.us. S. 742-109<sup>th</sup> Congress (2005):Preservation of Antibiotics for Medical Treatment Act of 2005,GovTrack.us
6. Sheth V M ;Weitzul,S .Postoperative topical antimicrobial use.Dermatitis: contact,atopic,occupational,drug.200 8:19(4): 181-89.
7. Luyt CE , Brechot N, Trouillet JL, Chastre J. Antibiotic stewardship in the intensive care unit. Crit Care. 2014;18(5):480
8. Lushnaik BD. Antibiotic resistance: a public health crisis. Public Health Rep.2014;129(4):314-316
9. Spellberg B, Gilbert DN. The future of antibiotics and resistance: a tribute to a career of leadership by John Bartlett. Clin Infect Dis. 2014;59(suppl 2):S71-S75
10. “WHO’s first global report on antibiotic resistance reveals serious,

- worldwide threat to public health"Retrieved 2014-05-02
11. Gilberg K, Laouri M, Wade S, Isonaka S."Analysis of medication use patterns;apparent overuse of antibiotics and underuse of prescription drugs for asthma,depression, and CHF".*J Manag Care Pharm.*2003;9(3):232-7
  12. Kwong JC,Maaten S,Upshur RE, et al. The effect of universal influenza immunization on antibiotic prescriptions: an ecological study. *Cin Infect Dis.*2009;49(5):750-756
  13. Harnden A., Perera R., Brueggemann A.B., Mayon-White R., Crook D.W., Thomson A., Mant D. Respiratory infections for which general practitioners consider prescribing an antibiotic: A prospective study. *Arch. Dis. Child.* 2007;92:594–597
  14. Society for Healthcare Epidemiology of America. Compendium of Strategies to Prevent Healthcare-Associated Infections in Acute Care Hospitals. [www.shea-online.org/about/compendium.cfm](http://www.shea-online.org/about/compendium.cfm). Accessed November 18, 2010.
  15. Centers for Disease Control and Prevention. 12 steps to prevent antimicrobial resistance among long-term care residents. [www.cdc.gov/drugresistance/healthcare/ltc/12steps\\_ltc.htm](http://www.cdc.gov/drugresistance/healthcare/ltc/12steps_ltc.htm). Accessed October 4, 2010.