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Empowering Women to Turn the Tide on Antibiotic Resistance

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ABSTRACT

Antibiotic resistance occurs when microorganisms especially bacteria evolve and develop their ability to withstand the effects of antibiotics, making infections harder to treat and potentially leading to more severe illness or death. Taking antibiotics when not needed, not completing the full course of antibiotics, over use of antibiotics in farm animals and crops are the important reasons for antibiotic resistance. Poor hygiene and sanitation make the situation worse. Antibiotic resistance, a growing global health crisis, disproportionately impacts women due to biological, social and economic factors. Women constitute a significant proportion of the global healthcare workforce, including doctors, nurses, pharmacists and medical waste managers. Women often serve as primary caregivers within families, influencing health decisions and antibiotic use within households. Women plays an important role in household hygiene and sanitation. In tradition bound families, women often don't have the freedom to take decision regarding their own health care. Many women workers are engaged in the activities or jobs relating to the disposal of left over medicines in the hospitals, old age homes, pharmacies, households *etc.* Empowering women with knowledge and resources can lead to effective antibiotic stewardship and a healthier future.

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I. Introduction

Antibiotic resistance is one of the most urgent global health threats of our time, undermining decades of medical progress and endangering the effectiveness of life-saving treatments. Antibiotic resistance occurs when bacteria evolve and develop the ability to withstand the effects of antibiotics, making infections harder to treat and potentially leading to more severe illness or death. Women, due to biological and social factors—such as pregnancy, childbirth, care giving responsibilities, and limited access to healthcare are disproportionately affected by antibiotic resistance. An understanding of gender inequities in antibiotic resistance is needed to address this issue effectively. While scientific, regulatory and clinical responses are essential for combating this crisis, an often-overlooked yet powerful force lies in the role of women. As caregivers, healthcare professionals, educators, and community leaders, women are uniquely positioned to influence behaviors around antibiotic use and infection prevention.

II.Significance of the Study

Antibiotic resistance, a growing global health crisis, disproportionately impacts women due to various biological, social and economic factors. According to the guidance released by WHO on 16/09/2024, women are 27% more likely to receive antibiotics throughout their lifetime than men. So its felt that understanding gender inequities in antibiotic resistance is a primary requisite for dealing with the global issue of antibiotic resistance. Women constitute a significant proportion of the global healthcare workforce, including doctors, nurses, pharmacists and medical waste managers. Women often serve as primary caregivers within families, influencing health decisions and antibiotic use within households. Empowering women with knowledge and resources can lead to effective antibiotic stewardship and a healthier future. Hence in the present study an attempt is made to examine the role of women in fighting against antibiotic resistance.

III. Objectives of the Study

1. To understand gender inequities in antibiotic resistance.

2. To examine the role of women in combating antibiotic resistance.

IV. Causes of Antibiotic Resistance

The following are the important causes for antibiotic resistance.

1. **Natural Resistance:** Bacteria can naturally develop resistance to certain antibiotics through genetic mutations or by acquiring resistance genes from other bacteria.

2.Overuse and Misuse of Antibiotics

a. ***Taking antibiotics when not needed*:** Using antibiotics for viral infections (like colds or the flu), which are not affected by antibiotics, or taking them unnecessarily for bacterial infections that might resolve on their own, puts pressure on bacteria to develop resistance.

b. ***Not completing the full course of antibiotics*:** If a course of antibiotics is stopped prematurely, resistant bacteria might survive and multiply, leading to a more difficult infection to treat.

c. ***Antibiotic use in animal*s:** The use of antibiotics in livestock to promote growth or prevent disease can lead to the development and spread of resistant bacteria to humans through food consumption.

3. Poor hygiene and sanitation: Lack of proper hygiene and inadequate sanitation facilities can facilitate the spread of antibiotic-resistant bacteria from person to person.

4. Improper Waste Management**:** Improper disposal of unused antibiotics and medical waste leads to contamination of water and soil.

5. Overuse of Antibacterial cleaning agents: Antibacterial products sold for hygienic or cleaning purposes may limit the development of immunity to environmental antigens in both children and adults. Consequently, immune-system versatility may be compromised, possibly increasing morbidity and mortality due to infections that wouldn't normally be virulent.

Spread of Resistance:

a. **Direct contact:** Resistant bacteria can spread directly from person to person through contact with contaminated hands, surfaces, or equipment.

b. **Indirect contact:** Resistant bacteria can also spread indirectly through contaminated water, food, or the environment.

c. **Hospital settings:** Hospitals are particularly vulnerable to the spread of antibiotic-resistant bacteria due to the high concentration of patients and healthcare workers, as well as the use of antibiotics.

V. Consequences of Antibiotic Resistance

Antibiotic resistance poses a significant threat to global public health. Here's a breakdown of its key consequences:

1.Increased Morbidity and Mortality:

a. ***Treatment Failures:*** Infections that were once easily treatable with antibiotics become difficult or impossible to cure. This leads to prolonged illnesses, increased complications, and a higher risk of death.

b. ***Spread of Infections:*** Resistant bacteria can spread easily, particularly in healthcare settings, leading to outbreaks of severe infections.

c. ***Rise of "Superbugs":*** Bacteria that are resistant to multiple antibiotics, known as "superbugs," are emerging, leaving very few or no treatment options.

2.Economic Impact:

a. ***Increased Healthcare Costs:*** Treating resistant infections requires more expensive and prolonged hospital stays, more intensive care, and the use of more costly drugs.

b. ***Loss of Productivity:*** Prolonged illnesses and hospital stays due to resistant infections can lead to significant losses in productivity.

c. ***Increased Healthcare Expenditures:*** The rising costs of treating resistant infections place a significant financial burden on individuals, families, and healthcare systems.

d. ***Threat to Agriculture:*** Antibiotics are also used in animal agriculture, and resistance in those areas can transfer to human pathogens, and also affect food production.

The rate of new antibiotic development is not keeping pace with the rapid spread of antibiotic resistance. Antibiotic resistance is a global problem that can spread rapidly across borders through travel and trade. Antibiotic resistance threatens to reverse the progress made in modern medicine, returning us to a time when even common infections could be life-threatening.

VI. Women and Antibiotic Resistance

Antibiotic resistance, a growing global health crisis, disproportionately impacts women due to biological, social, and economic factors.

1.**Biological Factors:**

a. Urinary Tract Infections (UTIs): Women are anatomically more prone to UTIs, which are frequently treated with antibiotics. The frequent use of antibiotics for UTIs contributes to the development of antibiotic-resistant bacteria.

b. Reproductive Health: Conditions related to reproductive health, including sexually transmitted infections leads to requirement of antibiotic treatment. Women face unique risks related to infections, especially during pregnancy, childbirth, and menstruation. Hormonal changes throughout a woman's life can also affect their susceptibility to infection.

2. **Healthcare Access and Socioeconomic Factors:**

Women, particularly in low- and middle-income countries, face barriers to access quality healthcare leading to delayed or inappropriate treatment of infections.

3. Work and Livelihood:

a. In many places, women are often the paid or unpaid care givers, and are in closer proximity to those that are ill. This increase their exposure to pathogens.

b. In the developing countries a major proportion of the working women are employed in the agricultural sector. The overuse of antibiotics is widespread in crop cultivation as well as animal husbandry. There is a high chance for women working in the agriculture sector to get affected by antibiotic resistant bacteria.

c. The task of cleaning and disposing of medical waste in hospitals, pharmacies, and households is commonly performed by women workers. This puts them at risk of infection and exposure to antibiotic-resistant bacteria.

VII. Empowering Women to Fight Against Antibiotic Resistance

Women can be empowered to fight against antibiotic resistance in the following different ways.

1. Education and Awareness:

Provide women with accurate information about antibiotic resistance, its causes, and consequences. Educate them on the appropriate use of antibiotics, emphasizing that they are ineffective

against viral infections. Utilize community-based programs and women's groups (like Kudumbashree Ayalkoottam) to spread awareness.

Improve women's understanding of health and hygiene practices, including infection prevention and control. Empowering women with knowledge about infection prevention during pregnancy and childbirth can significantly reduce antibiotic reliance. Educate women on the importance of hand-washing, sanitation, and vaccination to prevent infections. Educate on safe food preparation, and handling of food, to prevent food born infections. Empower them to make informed decisions about their own health and the health of their families.Community workshops can be conducted in regional languages to educate women.

2.Access to Healthcare

Affordable Healthcare: Ensure women have access to affordable and quality healthcare services, reducing the need for self-medication or misuse of antibiotics.
Telemedicine: Use technology to provide rural and under served women with access to medical advice, reducing reliance on over-the-counter antibiotics.

3.Sustainable Practices in Agriculture

Educate women farmers on alternatives to antibiotics in livestock, such as vaccines, probiotics etc. Encourage women to adopt organic farming practices that reduce reliance on antibiotics.

4. **Gender-Responsive Policies**:

Advocate for policies that address women's specific needs in healthcare and agriculture.

5. **Gender-Sensitive Data:**

Collect and analyze data on how antibiotic resistance affects women differently and involve women in designing solutions.

6. Leadership and Advocacy

Encourage women to take leadership roles in healthcare, policy-making, and research related to antibiotic resistance. Train women to become advocates in their communities, spreading awareness about antibiotic resistance and promoting responsible antibiotic use.

7. **Healthcare Professionals:**

Support women in healthcare professions to become leaders in antibiotic stewardship programs.

8. Training relating to medical waste disposal:

Women working in the field of cleaning and medical waste disposal should receive comprehensive training to ensure safe practices and reduce the risk of antibiotic resistance. Those who works in initiatives like'Haritha Karma Sena' of Kerala should be given guidelines regarding segregation and disposal of unused or leftover medicines they collect from households.

VIII.Role of Women in Combating Antibiotic Resistance

While much attention has been paid to scientific and pharmaceutical solutions, the social dimensions of antibiotic resistance are equally critical—particularly the role of women. Women play a central role in healthcare at every level: as caregivers in households, frontline workers in health systems, and decision-makers in communities. Their influence over antibiotic use, hygiene practices, and health-seeking behaviors makes them vital allies in the fight against antibiotic resistance.

1. Healthcare Providers

Women make up a significant portion of the healthcare workforce as nurses, doctors, and pharmacists They are on the front line of prescribing and administering antibiotics. By adhering to guidelines for appropriate antibiotic use, they can help prevent over-prescription and misuse.

2. Caregivers

Women are often the primary caregivers in families. They can ensure that antibiotics are used correctly and that other members of the family complete their prescribed courses. Women can help prevent the unnecessary use of antibiotics in the family for viral infections such as cold and influenza.

3. Community Education:

Women centered institutions such as 'Kudumbasree' Neighborhood groups(Ayalkoottam) can lead community education efforts, spreading awareness about the dangers of antibiotic resistance and the importance of proper antibiotic use.

4. Farmers and Food Producers:

Women who are involved in agriculture and livestock management can advocate for and implement practices that reduce the use of antibiotics in farming, such as improving animal hygiene, using vaccines, and adopting organic farming methods.

5. Consumer Choices:

Women often make purchasing decisions for households. By choosing meat and produce from farms that use antibiotics responsibly, they can drive demand for more sustainable practices.

6. Infection Control:

Since women often manage household hygiene and infection control practices by ensuring proper sanitation, hand washing, and food safety, they can reduce the spread of infections that might otherwise require antibiotic treatment.

7. Community Leaders:

Women leaders can mobilize communities to take collective action against antibiotic resistance, such as organizing clean-up drives to reduce infection rates or campaigns to promote vaccination.

8. Advocates and Policymakers:

Women in positions of influence can advocate for policies that promote the responsible use of antibiotics, fund research into new antibiotics, and support global initiatives to combat antibiotic resistance. Women involved in global health organizations can work across borders to implement strategies that reduce antibiotic resistance, such as improving access to clean water, sanitation, and healthcare in developing countries.

IX.Conclusion

By empowering women through education, leadership, and access to resources, we can harness their potential to combat antibiotic resistance effectively. Role of women in healthcare, education, agriculture, and household management, position them as key players in the fight against antibiotic resistance. By leveraging their influence in these areas, women can drive significant change, promoting the responsible use of antibiotics and helping to safeguard these vital medicines for future generations.

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