



NEWS LETTER

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EDITORIAL CHANGING PATTERNS IN BUGS AND DRUGS IN HOSPITAL

Antimicrobial Resistance (AMR) is a universal problem. Its spread does not recognize country borders. The emergence and spread of drug-resistant pathogens threaten our ability to treat common infections and to perform life-saving procedures including cancer treatment, organ transplantation and other surgeries. Antimicrobials – including antibiotics, antivirals, antifungals, and antiparasitics – are medicines used to prevent and treat infectious diseases in humans, animals and plants.

AMR is a natural process that happens over time through genetic changes in pathogens. Its emergence and spread is accelerated by human activity, mainly the **misuse and overuse of antimicrobials** to treat, prevent or control infections in humans, animals and plants.

Who is smart- we or bacteria – let's find

Bacteria is single celled structure without any brain and we (humans) have brain and well developed organ system but still bacteria are stronger and brainy than us.

In 1928, Alexander Fleming discovered the first antibiotic, penicillin, and by the 1930s, the first antibiotic had become commercially available but became resistant in 1941. Today, after less than a century later, we are facing health crisis as many high class of drugs that have commonly been used are no longer effective and not available for treatment. End result is “superbugs” Superbugs are strains of bacteria that are resistant to all or almost all antibiotics, including last-resort drugs called carbapenems.

- Carbapenem-Resistant Enterobacteriaceae are nightmare bacteria. They pose a triple threat.
- First, they're resistant to all or nearly all antibiotics.
- Second, they have high mortality rates. They kill up to half of people who get serious infections with them.
- Third, they can spread their resistance to other bacteria.

In the study of national AMR surveillance conducted by ICMR and NCDC, Enterobacterales and non-fermenting Gram-negative bacilli (*Pseudomonas aeruginosa* and *Acinetobacter baumannii*) were reported to be most common Gram-negative pathogens. Over 50% of the infections in most ICUs in tertiary care centres in India are caused by difficult-to-treat (DTR) Gram-negative pathogens. In India, a sharp increase in carbapenem resistance in Gram-negative pathogens is seen, which leaves patients with limited treatment options and increases the risk of AMR attributed mortality in patients. Further, the declining effectiveness of antibiotics imposes

potentially large health and economic burden.

Below is the table which summarizes the data on susceptibility of key antibiotics (modified from ICMR and NCDC data of 2023). It clearly conveys the message that carbapenem resistance is very high in *Acinetobacter Baumannii* (close to 90%), *Klebsiella Pneumoniae* (close to 50-75%).

Organism		CommunityAcquired Infection	Health care associated Infection
E coli	Meropenem Susceptibility	71.2%	53.38%
	Amikacin susceptibility	82.8%	73.19%
Klebsiella Pneumoniae	Meropenem Susceptibility	47.39%	22.19%
	Amikacin susceptibility	53.5%	33.9%
Acinetobacter Baumannii	Meropenem Susceptibility	11%	4.4%
	Minocycline Susceptibility	52.5%	58.1%
	Amikacin susceptibility	13.6%	8.1%
Pseudomonas aeruginosa	Meropenem Susceptibility	57.4%	42.6%
	Amikacin susceptibility	67.16%	59.5%
	Pip-Tazo susceptibility	56.7%	57.3%
Enterococcus faecalis	Vancomycin susceptibility	96.15%	90.05%
	Ampicillin susceptibility	40.8%	31.06%
Enterococcus faecium	Vancomycin susceptibility	68.18%	64.2%
	Ampicillin susceptibility	23.3%	7.26%
Staphylococcus aureus	Oxacillin susceptibility	52.9%	52%
	Vancomycin susceptibility	98.6%	96.5%

Some of the main drivers of AMR?

One of the primary driver is the overuse and misuse of antibiotics in both human medicine and agriculture. In many cases, antibiotics are prescribed when they are not necessary or are not used correctly. This can lead to the survival and proliferation of resistant bacteria.

Message for prescribers

- Everytime antibiotics are Prescribed —
- Order recommended cultures before antibiotics are given.
 - Make sure indications, dose and expected duration are specified in the patient record .
 - Reasses within 48 hrs and de-escalate / escalate according to sensitivity report or stop if not required
 - Clearly distinguish whether your patient is suffering from community acquired infection or hospital acquired infection.
 - Community acquired bacterial infections can be easily managed by using cephalosporins, aminoglycosides, macrolides and tetracyclines depending on indications, Carbapenems, polymyxins and combination therapies should be restricted to the treatment of hospital acquired infections
 - We should also remember that India is a TB endemic country so antibiotics like Levofloxacin and Linezolid should not be used indiscriminately as these are important drugs to manage Drug resistant TB.

(Continued on 4th Page)

EMPOWERING MASTECTOMY PATIENTS THROUGH RECONSTRUCTIVE SURGERY THE NORMALCY OF LIFE BEYOND CANCER

On a global scale, breast cancer is the most common cancer in women worldwide, and the most common cancer among Indian women, comprising about 27% (164,000 per year) of all female cancers according to ICMR. Mastectomy, the surgical removal of one or both breasts, is a common treatment for breast cancer. While this procedure can save lives, it leaves women physically and emotionally scarred. Breast reconstruction emerges as a critical component in the holistic care of women who undergo mastectomies. Less than 1% undergo reconstruction in India in contrast to 30% and 20% in the UK and US respectively. This article aims to highlight the need for breast reconstruction in Northern India and its profound impact on the well-being of breast cancer survivors. We will also explore the various aspects of breast reconstruction, including the different surgical techniques, and considerations for choosing the right method.

Understanding the Impact of breast cancer and the advantages of Reconstruction:

Mastectomy results in profound physical changes that can affect a woman's self-esteem, body image, and overall quality of life. The loss of a breast can leave women feeling incomplete, leading to a range of emotional challenges such as depression, anxiety, and decreased self-confidence. Breast reconstruction serves as a transformative procedure that helps restore a sense of normalcy and wholeness to breast cancer survivors. By recreating the breast mound, reconstruction enables women to regain their feminine identity and enhances their body image. Studies have shown that breast reconstruction contributes to a significant improvement in overall quality of life and mental health outcomes for breast cancer survivors.

Breast reconstruction benefits individual survivors and has a broader impact on society. By empowering women to regain their self-confidence and body image, breast reconstruction helps them reintegrate into social and professional spheres. It promotes inclusivity, and acceptance, and breaks down the stigma surrounding breast cancer. Furthermore, it encourages early detection and proactive management of breast cancer, as women are more likely to seek medical assistance knowing that reconstructive options are available. For patients with BRCA gene mutations, risk-reducing mastectomies and reconstruction have the potential to normalise the lifestyle of a patient which otherwise can deeply affect their self-esteem.

Access to Breast Reconstruction:

Despite the evident benefits, access to breast reconstruction services remains a challenge in Northern India. Limited awareness about the availability and importance of breast reconstruction, coupled with financial constraints, hinders many women from accessing this vital procedure. Rajiv Gandhi Cancer Institute in Northern India has established itself as a pioneer in providing excellent breast reconstruction services, with a dedicated team of highly skilled surgeons, state-of-the-art facilities, and a patient-centric approach. The institute has become a beacon of hope for breast cancer survivors seeking breast reconstruction. The institute offers a comprehensive range of reconstructive options, including autologous tissue reconstruction, implant-based reconstruction, and combining both techniques

RECONSTRUCTIVE OPTIONS

There are several different techniques for breast reconstruction, including implants and tissue flaps. The decision on which method to use depends on various factors such as the patient's anatomy, overall health, and personal

preferences. It's important for women to have open discussions with their healthcare providers to explore all available options and make informed decisions.

I. Autologous Breast Reconstruction:

Autologous breast reconstruction involves using the patient's own tissue to recreate a natural-looking breast. The DIEP flap is the most commonly used autologous form of breast reconstruction which involves harvesting skin and fat from the lower abdominal area, specifically the deep inferior epigastric artery, while preserving the abdominal muscles. This technique minimizes the risk of abdominal muscle weakness or hernia. The harvested tissue is then shaped to create a new breast mound, providing a natural look and feel. DIEP flap reconstruction often results in a more aesthetically pleasing outcome and offers the added benefit of abdominal contouring, similar to a tummy tuck. Patients' thighs and back are other donor areas that may be used in those who may not have enough abdominal tissue for a DIEP flap or prefer not to use abdominal tissue.

II. Implant-Based Reconstruction:

Implant-based breast reconstruction involves the use of silicone or saline implants to recreate the breast shape and volume. This technique offers a less invasive option compared to autologous reconstruction and is suitable for patients who do not have sufficient donor tissue or prefer a simpler procedure.



Figure 1: Results of post-mastectomy delayed breast reconstruction using DIEP Flap

	<i>Autologous Reconstruction</i>	<i>Implant-Based Reconstruction</i>
<i>Advantages</i>	<ol style="list-style-type: none"> 1. Natural look and feel 2. Long-term durability 3. Reduced risks and complications 4. Additional body contouring benefits (Tummy tuck) 5. Psychological benefits 	<ol style="list-style-type: none"> 1. Less invasive procedure 2. Shorter surgical and quicker recovery time 3. No donor site morbidity
<i>Disadvantages</i>	<ol style="list-style-type: none"> 1. Longer surgical procedure and recovery time 2. Potential for weakness at donor sites 	<ol style="list-style-type: none"> 1. Less natural look and feel 2. Risk of implant-related complications 3. Potential for future implant-related revision surgeries 4. Potential risk of Breast implant-associated cancer (BIA-ALCL)

Table 1: Autologous vs. Implant-Based Reconstruction, A Comparison

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Conclusion:

Breast reconstruction is an urgent and essential component of comprehensive care for breast cancer survivors in Northern India. It addresses the physical and psychological challenges faced by women who have undergone mastectomies, enabling them to reclaim their lives and

Dr Rajan Arora

Senior Reconstructive and Micro Vascular Surgeon

regain their sense of self. Access to breast reconstruction services needs to be improved through awareness campaigns, financial support, and patient education. By prioritizing breast reconstruction, we can provide a brighter future for breast cancer survivors, promoting their overall well-being and societal integration.

Dr Samarth Gupta

Attending consultant

DECODING INDIA'S GENETIC DIVERSITY: THE GENOME INDIA PROJECT

Introduction:

Genome sequencing has become a pivotal tool in understanding human diversity, disease susceptibility, and evolutionary history. India, with its vast population and rich genetic heritage, presents a unique opportunity for genomic research. Genome India Project has emerged as a pioneering initiative aimed at deciphering the genetic makeup of diverse populations across the Indian subcontinent.

Understanding the Genome India Project:

Department of biotechnology (DBT) under Ministry of Science and Technology, Government of India initiated the ambitious Genome India Project (GIP) on 3rd January 2020. It is led by the Centre for Brain Research at the Indian Institute of Science, Bengaluru, and involves collaboration with 20 institutions across the country.

On 27th February 2024, DBT announced completion of whole-genome sequencing and data analysis of 10,000 individuals belonging from 99 diverse communities, representing all major linguistic and social groups. This huge dataset of 8 petabytes is stored at the Indian Biological Data Centre (IBDC) in Faridabad which is India's first national repository for life science data.

India's population of 1.4 billion comprises over 4,600 population groups, many of which are endogamous (Matrimony in Close Ethnic Groups), contributing to genetic diversity and disease causing mutations. This project will help in understanding nature of different diseases in the Indian population and developing predictive diagnostic markers.

Objectives of the Genome India Project:

1. Mapping Genetic Diversity: One of the primary goals of the Genome India Project is to map the genetic diversity across different populations residing in India. India is home to numerous ethnic groups, each with its distinct genetic makeup shaped by historical migrations, cultural interactions, and geographical isolation. By sequencing genomes from various ethnic communities, the project seeks to unravel the underlying genetic variations and their implications for health and disease.

2. Understanding Disease Susceptibility: Genetic factors play a significant role in determining an individual's susceptibility to various diseases including cancers. The Genome India Project aims to identify genetic markers associated with prevalent diseases in the Indian population, such as diabetes, cardiovascular disorders, and certain cancers. By elucidating the genetic predispositions, researchers can develop more targeted diagnostic and therapeutic interventions tailored to the Indian populace.

3. Genomic Medicine: Genomic insights have the potential to

revolutionize healthcare by enabling personalized medicine approaches. Through the Genome India Project, researchers aim to integrate genomic data into clinical practice, facilitating more accurate disease diagnosis, prognosis, and treatment selection. This personalized approach holds the promise of improving healthcare outcomes and reducing the burden of disease in India..

4. Ethical Considerations: Genomic research raises several ethical considerations, particularly concerning privacy, consent, and data sharing. The Genome India Project emphasizes ethical guidelines and stringent data protection measures to ensure the privacy and confidentiality of participants' genetic information. Additionally, the project prioritizes obtaining informed consent from participants and fostering transparent communication about the research objectives and potential implications.

Challenges and Opportunities:

While the Genome India Project holds immense promise, it also faces several challenges. One of the primary challenges is the sheer scale and diversity of India's population, encompassing numerous ethnicities, languages, and socio-cultural backgrounds. Ensuring adequate representation from all population groups while maintaining ethical standards and data quality poses a significant logistical challenge.

Moreover, genomic research requires substantial infrastructural and technological capabilities, including high-throughput sequencing platforms, computational resources for data analysis, and bioinformatics expertise. Collaborative efforts between academia, industry, and government are essential to address these challenges and build robust genomic research infrastructure in India.

Despite these challenges, the Genome India Project presents unprecedented opportunities for advancing scientific knowledge, improving healthcare outcomes, and fostering innovation. By harnessing the power of genomics, India can leapfrog in healthcare delivery, contribute to global scientific advancements, and empower its population with personalized health solutions.

Conclusion:

The Genome India Project represents a pioneering initiative aimed at unlocking the genetic diversity and potential of India's populace. By sequencing thousands of genomes from diverse ethnic groups, the project promises to yield invaluable insights into human health, disease susceptibility, and population history. Through collaborative efforts and ethical considerations, the Genome India Project paves the way for a future where genomic medicine transforms healthcare delivery and empowers individuals with personalized health solutions tailored to their unique genetic makeup.

Dr Kapil Goyal

Consultant , Medical oncology , RGCIRC Niti bagh

EDITORIAL (CONTINUED)

Message for everyone—

Antimicrobial resistance is a serious threat to public health globally. It is a slower-moving pandemic than COVID-19, so we are fast running out of treatment options. To some extent we all are responsible for this situation as we have been using antibiotics for all disorders, may it be viral or fungus. Remember—

You will be alright after 7 days without antibiotics. You will be alright after one week with antibiotics. Choice is yours!

1. Antibiotics have no effect on viral illness.
2. Overusing antibiotics causes resistance.
3. If your doctor decides you need an antibiotic, make sure you take them as prescribed.
4. Your body's immune system can often protect against infection without the need for antibiotics. Do not expect your doctor to prescribe antibiotics every time you are ill.
5. Even if you start to feel better, always complete the full course.
6. Never save antibiotics for later use or share them with other people.

- Follow good infection control practices like clean hands, food safety

- Vaccinate yourself for vaccine preventable diseases like Typhoid, pneumococcus and influenza (even adults need vaccines)

Message for Health care professionals and health care Institutions

- Follow hospital infection control practices with utmost diligence
- Vaccinate yourself and encourage your patients to take vaccines (reduce hospital admission and hence antibiotic use)
- Every health care facility should have antibiotic policy and monitor pattern of bugs within the Institute.
- Every hospital should have infection control committee. Any outbreak of infection within hospital or community should be investigated.)

Guest Editor-Dr. Neelam Sachdeva
- Chief of Microbiology, Head CSSD & Infection control Officer, RGCIRC

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Dr. A. K. Dewan (Editor)