medicines. The medicines found effective were Pulsatilla nigricans, Mercurius solubilis, Silicea, Chamomilla, Lycopodium clavatum & Sulphur. [xix]

6. **OscillococcinumR in patients with influenza-like syndromes: A placebo-controlled double-blind evaluation**

   In the study, 188 patients received the test drug and 184 patients were assigned to the placebo. The clinical trial showed that treatment of influenza-like syndromes with Oscillococcinum has a positive effect on the decline of symptoms and on the duration of the diseases. [xx]

7. **Effect of Homoeopathic medicines on daily burden of symptoms in children with recurrent upper respiratory tract infections**

   In both, the treatment and placebo groups the use of antibiotics was greatly reduced compared with that in the year before entering the trial (from 73 to 33 in the treatment group and from 69 to 43 in the placebo group). The proportion of children in the treatment group having adenoidectomies was lower in the treatment group (16%, 8/50) than in the placebo group (21%, 9/42). The proportion having tonsillectomies was the same in both groups (5%). [xxi]

8. **Homoeopathy in the Age of Antimicrobial Resistance: Is It a Viable Treatment for Upper Respiratory Tract Infections?**

   Multiple peer-reviewed studies were found in which homoeopathy had been used to treat URTIs and associated symptoms (cough, pharyngitis, tonsillitis, otitis media, acute sinusitis, etc.). Nine randomised controlled trials (RCTs) and 8 observational/cohort studies were analysed, 7 of which were paediatric studies. Seven RCTs used combination remedies with multiple constituents. Results for homoeopathy treatment were positive overall, with faster resolution, reduced use of antibiotics and possible prophylactic and longer-term benefits. In the light of antimicrobial resistance, homoeopathy offers alternative strategies for minor infections and possible prevention of recurring URTIs. [xxii]

9. **Homoeopathy as replacement to antibiotics in the case of Escherichia coli diarrhoea in neonatal piglets**

   Piglets of the Homoeopathic treated group had significantly less E. coli diarrhoea than piglets in the placebo group (P<.0001). Especially piglets from first parity sows gave a good response to treatment with Coli 30K. The diarrhoea seemed to be less severe in the Homoeopathically treated litters, there was less transmission and duration appeared shorter. [xxiii]

10. **Individualized Homeopathic Treatment in Women with Recurrent Cystitis: A Retrospective Case Series**

    Here, four female cases with recurrent urinary tract infections were reported where they were treated successfully with the Homoeopathic strategy (Indicated medicines were ***Lac caninum, Pulsatilla, Causticum, Arsenicum album***) after several conventional approaches revealed no improvement. [xxiv]

11. **Homoeopathic treatment in addition to standard care in multi drug resistant pulmonary tuberculosis: a randomized, double blind, placebo controlled clinical trial**

    In this study, statistically significant improvement was seen in Chest X-Ray (CXR) in 37 (61.7%) in SR (Standard MDR-TB regimen) + H (individualized homeopathic medicine) and 20 (33.3%) patients in SR + P group (identical placebo) (p = 0.002). Subgroup analyses of culture positive patients showed statistically significant improvement in CXR (p = 0.0005), weight gain (p = 0.026), increase in hemoglobin (p = 0.017) and reduction in ESR (p = 0.025) with add on homoeopathy. The cure rate was 11.4% more in SR + H group as compared to placebo group. Change in sputum culture conversion, was not statistically significant. Add on homoeopathy in addition to standard therapy appears to improve outcome in MDR-TB. Larger scale studies using a standardized homoeopathic treatment regime should be conducted. [xxv]

& Many more....

LIST OF THE DRUG RESISTANT BACTERIAS [xxvi]

CRITICAL CATEGORY

Acinetobacter baumannii, Enterobacteriaceae, Pseudomonas aeruginosa, Klebsiella pneumonia, Escherichia coli, Enterobacter spp., Serratia spp., Proteus spp., Providencia spp., Morganella spp.

HIGH CATEGORY

Enterococcus faecium, Staphylococcus aureus, Helicobacter pylori, Campylobacter, Salmonella spp., Neisseria gonorrhoeae

MEDIUM CATEGORY

Streptococcus pneumonia, Haemophilus influenza, Shigella spp.

HOMOEOPATHIC MEDICINES COMMONLY FOUND EFFECTIVE

Commom Cold- *Acon, Ars Alb, Bell, Bry, Cham, Eupatorum Perf, Hepar Sulph, Merc Sol, Puls, etc.*

Influenza Like illness- *Aconite, Ars Alb, Bell, Bry, Gels, Merc Sol, Nat mur, Nux Vom, Rhus Tox, Sepia, etc.*

Rhinosinusitis- *Allium cepa, Ars Iod, Euphrasia, Hydrastis Canadensis, Kali Bichrom, Merc, Sticta, etc.*

Cough and Expectoration- *Allim Cepa, Ammon. Carb., Antim Tart, Bell, Drosera, Iod, Kali Bichrom , Kali Carb, Puls, Rumex, Spongia, Sticta, etc.*

Otitis Media- *Acon , Ars Iod, Bell, Caps., Chamomilla, Calcarea Carb, Cina, Fer-P., Hepar Sulph, Merc Sol, Puls , etc.*

Urinary Tract Infection- *Apis, Arnica, Calcarea Carb, Canth, Carbo-Veg, Lycopodium, Sepia, Pulsatilla, Sulphur, Nux Vom, Hepar Sulph, Rhus Tox, Tuberculinum, Natrum Mur, Sulphur, etc.*

Gastroenteritis- *Aloes, Apis, Ant-tart, Arsenic alb, Bell, Gels, Mag-c, Hydrastis, Ipecac, Kali-bi, Nux Vom, Puls, Phosphorus, Pyrogen, Rumex, Silicea, Sulphur, Thuja, Veratrum alb, etc.*

Disclaimer: All Homoeopathic medicines are to be taken with prior consultation with qualified Homoeopathic practitioner only.

REFERENCES

[i] Palmer GH, Buckley GJ, editors. Board on Population Health and Public Health Practice; Committee on the Long-Term Health and Economic Effects of Antimicrobial Resistance in the United States. In: Combating Antimicrobial Resistance and Protecting the Miracle of Modern Medicine. Washington (DC; US): National Academies Press; 2021.

[ii] Ten threats to global health in 2019, Geneva: World Health Organisation; 2019

[iii] Van Boeckel TP, Gandra S, Ashok A, Caudron Q, Grenfell BT, Levin SA,et al. Global antibiotic consumption 2000 to 2010: An analysis of national pharmaceutical sales data. Lancet Infect Dis 2014; 14:742-50.

[iv] McGettigan P, Roderick P, Kadam A, Pollock AM. Access, watch, and reserve antibiotics in India: Challenges for WHO stewardship. Lancet Glob Health 2017;5:e1075-6

[v] Sharma P, Kapoor Study of prescribing pattern for rational drug therapy. Jammu Kashmir Sci 2003; 5:107-9.

[vi] World Health Organization (WHO). Tracking AMR Country Self-Assessment Survey (TrACSS) 2021-2022.

[vii] United Nations Environment Programme. Bracing for Superbugs: Strengthening environmental action in the One Health response to antimicrobial resistance. Geneva.2023

[viii] https://www.who.int/news-room/fact-sheets/detail/antimicrobial-resistance

[ix] Central TB Division. TB India 2017: Revised National Tuberculosis Program Annual Status Report. New Delhi, India: Directorate General of Health Services, Ministry of Health and Family Welfare; 2017.

[x] Center for Disease Dynamics, Economics & Policy 2015. State of the World's Antibiotics. Washington, DC: Center for Disease Dynamics, Economics & Policy; 2015. Available from: https://www.cddep.org/wp-content/uploads/2017/06/swa_edits_9.16.pdf

[xi] Dixit A, Kumar N, Kumar S, Trigun V. Antimicrobial Resistance: Progress in the Decade since Emergence of New Delhi Metallo-β-Lactamase in India. Indian J Community Med. 2019 Jan-Mar;44(1):4-8. doi: 10.4103/ijcm.IJCM_217_18. PMID: 30983704; PMCID: PMC6437806.

[xii] Ministry of Food Processing Industries.Update on Overuse of Anti Microbial Resistance, Red Line awareness campaign on Anti-Microbials Resistance by Union Government, Treatment guidelines for Anti-Microbial use in common syndromes released. New Delhi : Ministry of Health and Family Welfare (MoHFW);2023.

[xiii] Nita M. Ramchandani. Homoeopathic treatment of upper respiratory tract infections in children: Evaluation of thirty case series. Complementary Therapies in Clinical Practice 16 (2010) 101–108.

[xiv] Lex A.L.B. Rutten.Homeopathy instead of antibiotics in Respiratory Tract Infections: Certainly less harmful, possibly more effective.La Revue d'Homéopathie. 2019;10(4): e47-e52

[xv] Munshi R, Talele G, Shah R. In-Vitro Evaluation of Antimicrobial Activities of Escherichia coli, Klebsiella pneumoniae, Salmonella typhi, Neisseria gonorrhoeae, and Candida albicans Nosodes. Homeopathy. 2022 Feb;111(1):42-48. doi: 10.1055/s-0041-1727149. Epub 2021 May 21. PMID: 34020481.

[xvi] Bandyopadhyay, B., Das, S., Sengupta, M., Saha, C., Das, K. C., Sarkar, D. & Nayak, C. (2010). Decreased Intensity of Japanese Encephalitis Virus Infection in Chick Chorioallantoic Membrane Under Influence of Ultradiluted Belladonna Extract. American Journal of Infectious Diseases, 6(2), 24-28.

[xvii] Prasad AB, Aathavan K, Vaiyapuri T, Samina AA, Sylum SSV, Chandraja CV. An in-vitro study of antimicrobial activity of Homoeopathic medicine pyrogenium against Escherichia coli. International Journal of Homoeopathic Sciences. 2023;7(2):72-76.

[xviii] Dutta SD, Maria RD. Homeopathic consideration for resistant endodontic bacteria Enterococcus faecalis: An in vitro comparative disc diffusion study. J Conserv Dent. 2020 Sep-Oct;23(5):528-532. doi: 10.4103/JCD.JCD_515_20. Epub 2021 Feb 10. PMID: 33911365; PMCID: PMC8066670.

[xix] Sinha MN, Siddiqui VA, Nayak C, Singh V, Dixit R, Dewan D, Mishra A (2012). Randomized controlled pilot study to compare homeopathy and conventional therapy in acute otitis media. Homeopathy; 101: 5-12.

[xx] Papp, R, Schuback G, et al (1998). The clinical trial showed that treatment of influenza-like syndromes with Oscillococcinum® has a positive effect on the decline of symptoms and on the duration of the disease.. British Homeopathic Journal, 87:69-76

[xxi] de Lange de Klerk ESM, Blommers J, Kuik DJ, Bezemer PD, Feenstra L (1994). Effects of Homoeopathic medicines on daily burden of symptoms in children with recurrent upper respiratory tract infections. British Medical Journal, 309:1329–1332

[xxii] Fixsen A. Homeopathy in the Age of Antimicrobial Resistance: Is It a Viable Treatment for Upper Respiratory Tract Infections? Homeopathy. 2018 May;107(2):99-114. doi: 10.1055/s-0037-1621745. Epub 2018 Feb 5. PMID: 29767829

[xxiii] Camerlink I, Ellinger L, et al (2010). Homeopathy as replacement to antibiotics in the case of Escherichia coli diarrhoea in neonatal piglets. Homeopathy, 99: 57–62.

[xxiv] Gaertner K, von Ammon K, Frei-Erb M. Individualized Homeopathic Treatment in Women with Recurrent Cystitis: A Retrospective Case Series. Complement Med Res. 2020; 27(3):193-199. doi:10.1159/000504317

[xxv] Chand KS, Manchanda RK, Mittal R, Batra S, Banavaliker JN, De I. Homeopathic treatment in addition to standard care in multi drug resistant pulmonary tuberculosis: a randomized, double blind, placebo controlled clinical trial. Homeopathy. 2014 Apr;103(2):97-107. doi: 10.1016/j.homp.2013.12.003. Erratum in: Homeopathy. 2015 Jul;104(3):163. PMID: 24685414

[xxvi]-https://www.who.int/news/item/27-02-2017-who-publishes-list-of-bacteria-for-which-new-antibiotics-are-urgently-needed

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HOMOEOPATHY IN ANTIMICROBIAL RESISTANCE



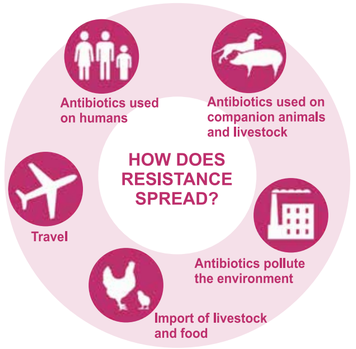
The fast pace of resistance to antimicrobial agents and the insufficient ability of existing conventional treatments open avenues for Homoeopathy in alleviating the crises of Anti-Microbial Resistance.

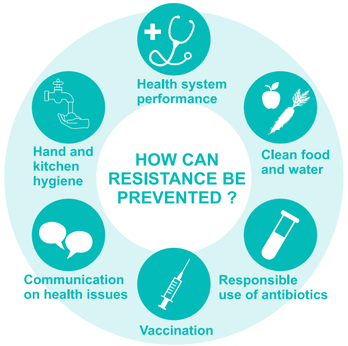
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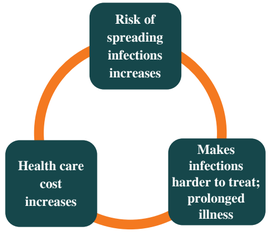
AN EMERGING THREAT TO THE WORLD- ANTIMICROBIAL RESISTANCE

- Anti-Microbial Resistance (AMR) is a health problem which threatens to undermine almost a century of medical progress[i] making it among the top 10 global health threats.[ii] It falls under the ICD 10 classification code Z-16.
- It is the ability of microorganisms (bacteria, viruses, fungi, and parasites) to resist the effects of antimicrobial drugs which is through genetic changes in pathogens. Its emergence and spread are accelerated by human activity, mainly the misuse and overuse of antimicrobials to treat, prevent or control infections in humans, animals, and plants.
- India is one of the largest consumers of antibiotics worldwide,[iii] and antibiotic sales continue to increase rapidly[iv] which leads to a high level of irrational use of medicines resulting in reduced treatment efficacy and contributing to problems like infections becoming difficult or impossible to treat, increasing the risk of disease spread, severe illness, disability and death.[v] The number of AMR deaths in India is higher than deaths from neoplasms, respiratory infections, tuberculosis, enteric infections, diabetes, kidney diseases, maternal and neonatal disorders.[vi]
- Median reported rates in 76 countries of 42% for third-generation cephalosporin-resistant E. coli and 35% for methicillin-resistant Staphylococcus aureus are a major concern for all of us. For urinary tract infections caused by E. coli, it was found that 1 in 5 cases exhibited reduced susceptibility to standard antibiotics like ampicillin, co-trimoxazole, and fluoroquinolones in 2020. Elevated resistance levels against critical antibiotics have also been found in Klebsiella pneumoniae, which is a common intestinal bacterium. Fungal infections can be difficult to treat, including due to drug-drug interactions for patients with other infections (e.g. HIV). The emergence and spread of multi-drug resistant candida auris, an invasive fungal infection, is of main concern.[vii]





IMPACT OF AMR



DO YOU KNOW WHAT'S THE PROBLEM WITH ANTIBIOTICS?

The more we use antibiotics inappropriately, the more the microbial world adapts. Antibiotics treat infections by killing bacteria, but now the bacteria are fighting back. Infections in humans, animals and plants are becoming difficult, sometimes impossible, to treat. Antimicrobial effectiveness is now in jeopardy because several antibiotics, antiviral, antiparasitic and antifungal treatments no longer work because of antimicrobial resistance[viii] and as they are becoming less effective, this leads to more severity of diseases, more complications and more no. of death of people.

ANTIMICROBIAL RESISTANCE - FAR MORE THAN A MEDICAL PROBLEM



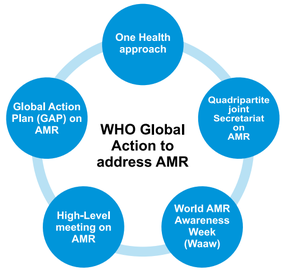
Poverty


Universal Health Coverage


Economic Growth


Health Inequity Socio-economy Gender

WHO GLOBAL ACTION TO ADDRESS AMR

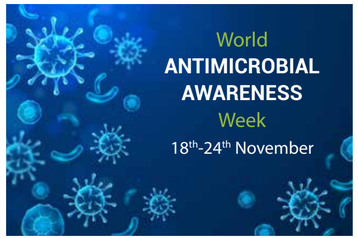


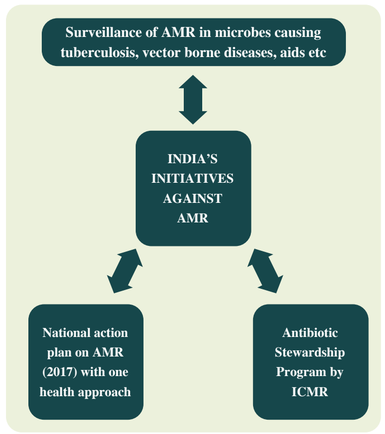
INDIA'S INITIATIVES AGAINST AMR

India carries one of the largest burdens of drug-resistant pathogens worldwide, including the highest burden of multidrug-resistant tuberculosis.[ix] Two million deaths are projected to occur in India due to AMR by the year 2050.[x]

WORLD AMR AWARENESS WEEK (WAAW)

It is a global campaign celebrated annually to improve awareness and understanding of AMR and encourage best practices among the public, One Health stakeholders and policymakers. It is celebrated from 18th to 24th November every year.





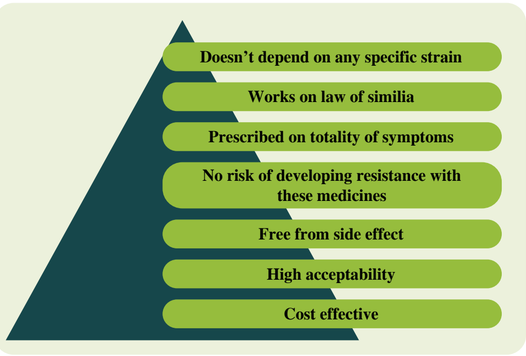
RED LINE CAMPAIGN

Public education about the issue of Antibiotic Resistance also came to the forefront in 2016 with the launch of the "Red Line campaign" which signifies A bold red coloured line on the antibiotic packaging, aiming to draw public attention to the dangers of its misuse and has been lauded internationally.[xi] To limit the sales of such medicines, the Government of India has also instituted regulatory measures, such as Schedule H and H1.[xii]



WHY HOMOEOPATHY?

Homoeopathy works on the principle of *"similia similibus curantur"* which takes into consideration the totality of symptoms of an individual thereby exhibiting its action at all levels. Homoeopathic medicines are not anti-pathogen specific, so it doesn't work upon any specific strains like conventional medicine, hence they act holistically. It has the potential to alleviate this crisis, as depicted by growing evidence, particularly from clinically effective studies. Some of the studies also suggested that the recurrence of infection is very less after Homoeopathic intervention which also reduces the use of antibiotics.[xiii] About 75% of all antibiotics are used in respiratory tract infections, but we need to treat more than 4,000 patients with antibiotics to prevent one serious complication. Homoeopathy in respiratory tract infections is comparable to the best evidence in conventional medicine to prevent serious complications.[xiv]



If Homoeopathy is used as the first line of treatment in treating upper respiratory tract infections especially in its initial stages, we may cut down 75% of the use of antibiotics thereby combating AMR.

EVIDENCE BASED HOMOEOPATHIC STUDIES AS A STANDALONE OR ADJUNCTIVE TO STANDARD CARE

1. **In-vitro evaluation of Antimicrobial Activities of Escherichia coli, Klebsiella pneumoniae, Salmonella typhi, Neisseria gonorrhoeae, and Candida albicans Nosodes**

   C. albicans polyvalent nosode 35C, 100C, N. gonorrhoeae 35C, and positive control amphotericin B showed inhibition of the growth of C. albicans species. *K. pneumoniae 35C, E. coli polyvalent nosode 100C,* and meropenem (positive control) showed inhibition of the growth of K, pneumoniae; this effect was not seen with ceftriaxone, ofloxacin and amoxicillin antibiotics. *E. coli polyvalent nosode 30C* showed inhibition of the growth of E. coli. This study reveals that the tested nosodes exhibited antibacterial potential against the corresponding micro-organisms and against other selected organisms studied using this assay.[xv]

2. **Effect of Homoeopathic medicine on Japanese Encephalitis Virus Infection on chorio-allantoic membrane (CAM) & suckling mice**

   Belladonna showed significantly decreased pock count in CAM in comparison to JE virus control. Belladonna could inhibit JE virus infection in CAM, which may be mediated through the glycosidase inhibitory role of calystegines present in belladonna. [xvi]

3. **An in-vitro study of antimicrobial activity of Homoeopathic medicine pyrogenium against Escherichia coli**

   Results showed that *Pyrogenium 30C* had the most antimicrobial activity against E.coli. It showed mild to moderate zone of inhibition with relative growth inhibition against E.coli of 7.14%. *pyrogenium 200C* showed negligible relative growth inhibition.[xvii]

4. **Homoeopathic consideration for resistant endodontic bacteria Enterococcus faecalis: An in vitro comparative disc diffusion study**

   Results showed that antimicrobial activity of the *acid benzoicum* extract was the highest followed by silicea extract and then calcium hydroxide.[xviii]

5. **Randomized controlled pilot study to compare Homoeopathy and Conventional therapy in Acute Otitis Media**

   In the Conventional group, all 40 (100%) patients were cured, in the Homoeopathy group, 38 (95%) patients were cured while 02 (5%) patients were lost to the last two follow-up. By the 3rd day of treatment, 4 patients were cured in Homoeopathy group but in Conventional group only one patient was cured. In the Conventional group antibiotics were prescribed in 39 (97.5%), no antibiotics were required in the Homoeopathy group. 85% of patients were prescribed six Homoeopathic