

TO THE ROOTS OF ANTIBIOTIC RESISTANCE**Dr. Prabhin K.P¹ Dr. Soumya Saraswathi M MD (Ayu)²****Dr. Subrahmanya.P.MD (Ayu), Ph.D³ Dr. Mithun R.G MD (Ayu)⁴**

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Abstract:

Disease is a condition effecting both mind and body, and its nomenclature states various approach to understand the condition like *Papma, Jwara, Yakshma, Aadanga, Gada* etc. To understand this condition and to bring back the diseased to health is the first and foremost duty of the *Vaidya* for which there is inevitable requirements of four factors via, *Bhishak, Dravya, Upastha* and *Rogi*, which is the last and most important, without which the science will cease to exist. As previously mentioned the term *Gada* is synonymous to *Vyadhi* or *Roga*. So anything antagonistic to a *Gada* is termed as *Agada*. A *Vyadhi* or *Gada* is tackled with effective and judicious use of *Oushadha* or *Agada*. Here even a poison is considered as an effective *Oushada* if used rationally. Whereas a potent *Oushadha* can be fatal if used irrationally. In recent past in 20th century there was invention of a revolutionary mode of medication called, antibiotics* which strictly based its theory on action of medicines on living entities. Body acts effectively against the disease causing agents when the antibiotics are introduced in to it. Like everything, this also comes with its own drawbacks which seems strikingly similar to the concept in Ayurveda about use of *Oushadha* and knowledge of *Visha*. Antibiotic resistance occurs when bacteria change in response to the use of these medicines. Antibiotic resistance is rising to dangerously high levels in all parts of the world. Understanding the pathophysiology behind the antibiotic resistance via Ayurveda gives better scope against the adverse effect of antibiotic resistance.

Keywords: Antibiotic Resistance, *Visha, Visha gara vairodhika prasamana, Janapadodhwamkara vyadhis, Rasayana*

Introduction

Ayurveda is resurfacing, what once was considered bizarre and outdated is now a trend and innovation. Dr. Marc

Mitchell and Dr. David Wartinger¹ were awarded Nobel Prize for a technic of treatment mentioned years before in

samhitas. Ayurveda did always look upon the health of a person in a broad aspect considering personal social physical and mental levels. Treatment by giving medicine to a disease was merely a part of treatment modality explained in science of Ayurveda. It greatly understood and emphasized on understanding oneself and the world around. Starting from the day to day activities mentioned as in *Dinacharya* which dictates the regimens to be followed to therapies like *Rasayana* which rejuvenates the body and mind. Disease is a condition effecting both mind and body, and its nomenclature states various approach to understand the condition like *Papma*, *Jwara*, *Yakshma*, *Aadanga*, *Gada* etc². To understand this condition and to bring back the diseased to health is the first and foremost duty of the *Vaidya*³ for which there is inevitable requirements of four factors via, *Bhishak*, *Dravya*, *Upastha* and *Rogi*⁴. *Rogi* is the last and most important, without which the science will cease to exist. Hence proper understanding of *Catushpada* and its essence is required.

According to *Acarya*⁵ the excellence of all the aspects of *Catushpada* shows its effect on treatment which he states as a *Bheshaja*. And *Oushadha* mentioned in the *Catushpada* is only an aspect to be considered in treatment of a diseased condition. Whereas, *Bheshaja* encompasses all the potential effect of the *Catushpada*. As previously mentioned the term *Gada* is synonymous to *Vyadhi* or *Roga*. So anything antagonistic to a *Gada* is termed as *Agada*. A *Vyadhi* or *Gada* is tackled with effective and judicious use of *Oushadha* or *Agada*⁶. Here even a poison is considered as an effective *Oushadha* if used rationally. Whereas a potent *Oushadha* can be fatal if used irrationally.

Human body is an ingenious machine made of intricate parts and system which are always intertwined. And a slight derangement can cause the system to go haywire. Any factor which can cause this derangement has to be managed. Ayurveda has been doing this for ages and still holds strong. In recent past in 20th century there was invention of a revolutionary mode of medication called,

antibiotics⁷ which strictly based its theory on action of medicines on living entities. Body acts effectively against the disease causing agents when the antibiotics are introduced in to it. Hence bringing about normalcy. As it is used in array of disease its acceptability has drastically increased from the day of its genesis. Like everything, this also comes with its own drawbacks which seems strikingly similar to the concept in Ayurveda about use of *Oushadha* and knowledge of *Visha*⁸. The presentation of similar anomaly is termed as antibiotic resistance according to recent science of medicine.

Antibiotic resistance occurs when bacteria change in response to the use of antibiotics. Bacteria, not humans or animals, become antibiotic-resistant. These bacteria may infect humans and animals, and the infections they cause are harder to treat than those caused by non-resistant bacteria. Antibiotic resistance leads to higher medical costs, prolonged hospital stays, and increased mortality. The world urgently needs to change the way it prescribes and uses antibiotics. Even if

new medicines are developed, without behavior change, antibiotic resistance will remain a major threat⁹.

PRECAUTIONS¹⁰

- Irrational use of antibiotics without the prescription of a certified health professional.
- Always follow your health worker's advice when using antibiotics.
- Never share or use leftover antibiotics.
- Prevent infections by regularly washing hands, preparing food hygienically, avoiding close contact with sick people, practicing safer sex, and keeping vaccinations up to date.
- Prepare food hygienically, following the WHO Five Keys to Safer Food (keep clean, separate raw and cooked, cook thoroughly, keep food at safe temperatures, use safe water and raw materials) and choose foods that have been produced without the use of antibiotics for growth promotion or disease prevention in healthy animals.
- Cleanliness of surroundings.

Antibiotic is the biggest discovery of modern medical science and the irrational use of it makes the threat to the life. Similar concept is being told

when *Visha* and its use is mentioned. *Visha* is a broader term used according to context. Here the signs and symptoms of *Visha* described in the

classical texts of Ayurveda are similar to signs and symptoms of Antibiotic resistance¹¹.

Signs and symptoms of Antibiotic resistance	<i>Visha Lakshana</i>
Fever	<i>Jwara</i>
Pneumonia	<i>Phena</i>
Upper respiratory tract infection	<i>Swasa</i>
Respiratory failure	<i>Swasa</i>
Pulmonary hemorrhage	<i>Dusyati shonitam</i>
Bronchitis	<i>Hrudi vedanam</i>
Vomiting	<i>Chardhi</i>

Poison is given its due importance in causing any disease by the triads of Ayurveda via *Caraka samhitha*, *Susrutha samhitha* and *Ashtanga hrudaya*, wherein treatment in condition of affliction of poison is coined as *Agada tantra* by *Acharya Susrutha*¹², *Damshtra chikitsa* by *Acharya Vaghbata*¹³ and *Visha gara vairodhika prashamana chikitsa*¹⁴ by *Acharya Caraka*. Here emphasizing on *Visha gara vairodhika prashamana* by *Carakaacharya* gives us an insight on the extent of application of knowledge of *Visha* and its treatment.

In the context of explaining *Ashtangas* of Ayurveda¹⁵, the commentator *Cakrapani* explains the meaning of

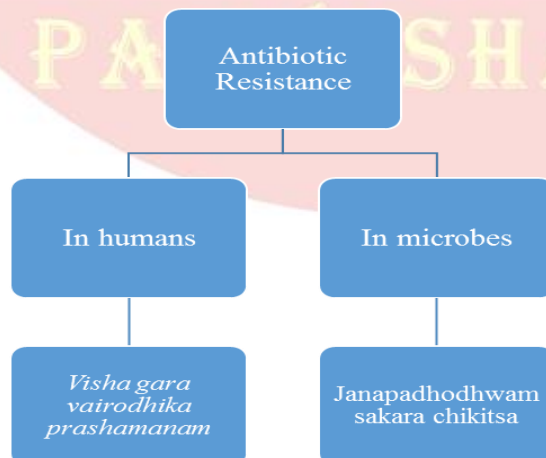
*Gara as Kalantara prakopi visham*¹⁶, which means *Gara* is the one which act as a *Visha* on prolonged use. Similarly according to commentator *Arunadutta*¹⁷ of *Ashtanga hrudaya*, *Damshtra* is having similar presentations to that of poisoning. Hence *Gara* can be considered to be the one which can fabricate the genesis of disease irrespective of its source of origin.

Antibiotics is a medicine that inhibits the growth or destroys microorganisms and it is commonly known that the use of antibiotics in any treatment has a structured protocol to be followed. Any disturbance to follow the protocol can generate its harmful effect on the body. Duration of use of antibiotics in any treatment is commonly not less than 7 days according to NIH¹⁸. In

India 15.7% of overall antibiotic use have antibiotic resistance due its prolonged irrational use. Prolonged use in any condition can cause habituation. Habituation diminishes the innate response to any frequently repeated stimulus irrespective of its positive or negative effect. Similar to habituation *Acharya Caraka* mentions the term *Satmya*¹⁹. *Gara visha lakshana* as previously mentioned is generated because of causes strikingly similar to prolonged irrational use of antibiotics.

Production of any antibiotic drug requires prolonged observation and systematic approach to have its effective positive outcome in its use. Though it is seen that there are innumerable antibiotics in the market for various kinds in diseases and which positively shows its effect on the

health sector, it comes with a major drawback when considered on the aspect of the production and its waste management²⁰. A report says that pharmaceuticals companies are the contributing factors to spread of drug resistant microbes and infections caused by them through unhygienic production processes and dumping of inadequately treated antibiotic waste. This can be considered as the underlying cause for the difficulty for management of antibiotic resistant microbes and the diseases caused by them, as these microbes are habituated or *Satmya* to the effluents or byproducts of improper or irrational waste management by pharmaceutical companies. These microbes which produce diseases are the cause for *Janapadhodhwamsa vyadhis*.²¹



In the same chapter there is the first reference of use of *Rasayana*²² for management of *Janapadhodhwamsakara vyadhis* where *Acarya* mentions *Rasayana chikitsa* as one of the most efficient mode of management when people suffer from *Janapadhodhwamsakara vyadhi* caused due to pollution or vitiation of *Vayu, Udaka, Desa* and *Kala* which effects a large number of population. In the same chapter there is a mentioning of effect of *Rakshasa*²³ which can be correlated to micro-organisms in this context of Antibiotic Resistant micro-organisms. *Acarya* also mentions the importance of maintenance of proper *Agni*²⁴ for better results when the treatment of *Rasyana* is used. To bring out the maximum potential effect of *Rasayana chikitsa* maintaining the *Agni* to its highest can be done by judicious use of *Samshodhana chikitsa*²⁵ and proper *paschat karma*. This briefs about the management of *Janapadhodhwamsakara vyadhis* caused due to Antibiotic Resistant microbes where the resistance is

caused due to irrational and inappropriate waste management.

Also in antibiotic resistance in human body as previously mentioned presents itself with numerous diseases for which the line of management to be followed, according to *Acarya* is *Vishagara vairodhika prashamanam*. Here the meticulous use of *Vishagna dashemani*²⁶ has to be done. Keeping in mind that antibiotic resistance shows similar *lakshanas* like that of *Visha lakshanas* seen in the body. It includes *Haridra, Manjishta, Suvaha, Suksham ela, Paalindi, Candana, Kathaka, Sireesha, Sindhuvara* and *Sleshmaataka*. The infection is the crucial symptom seeing in the Antibiotic resistance and which leads to the fatality of a person. Many studies proved that *Haridra* is one of the best anti-inflammatory, anti-microbial and anti-bacterial drug²⁷. One of the active principle in *Haridra*, Curcumin has shown to inhibit a number of different molecules involved in inflammation including phospholipase, lipooxygenase, COX-2, leukotrienes, thromboxane, prostaglandins, nitric oxide,

collagenase, elastase, hyaluronidase, interferon-inducible protein, tumor necrosis factor, and interleukin-12.

For effective management of antibiotic resistance proper screening of causative factor and understanding the depth of its effect is of prime importance. The ultimate one suffering this antibiotic resistance is the human body whether it is caused due to improper waste management or irrational use of antibiotics. Hence understanding antibiotic resistance in the light of maintenance of health of oneself and the health of the society is inevitable in field of health science.

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Source of Support: NIL
Conflict of Interest : None declared

