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Medicines in Ancient Period

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Introduction

To know about the “Medicines in ancient period”, one has to study about the evolution of medicine. It is a long story stretching from prehistoric to modern times. Henry Siergerist, the medical historian stated that every culture had developed a system of medicine and studying ancient medicine is like studying their culture. With the continuing research in the medical and engineering fields, the medicines especially during 20th cent. have become very effective but at the same time complex and costly. Today, medicine is branching out from the bedside and hospital treatment to the wider community, with the main emphasis on the prevention of disease, early diagnosis and treatment, family planning methods and raising the standard of community health.

The various stages that led to the development of modern medicine can be described as follows:

Primitive Medicine: Thousands of years ago men attributed diseases and other calamities to the wrath of gods, adverse influence of stars and planets or to the invasion of the body by evil spirits. Their medicinal ways therefore, consisted of praying to gods, doing some rituals and sacrifices of animals and sometimes even of human beings, driving out evil spirits from the human body by noise or violence. Just like modern medicine uses vaccines for prevention of certain diseases, primitive men made use of charms and amulets to protect oneself from the eyes of evil spirits. Though the primitive men are extinct, we still come across certain queque doctors who use charms, mantras and magical remedies to cure certain illnesses. Smallpox which has now been eradicated from all over the world is still believed by some, to be caused due to a goddess.

Indian Medicine: ‘Ayurveda’ and ‘Siddha’ are the two Indian systems of medicine. Ayurveda, by definition means “Science of life” and is practised almost all over India. Siddha system is practised in Tamil speaking regions of South India. Ayurveda system originated around 5000 BC, during the Vedic times, when medical history was associated with certain mythological figures and sages. DHANVANTRI, the Hindu god of medicine is believed to have been born as a result of churning of the oceans during a tug of war between the gods and demons. According to some authorities, the medical knowledge in Atharvaveda (one of the 4 vedas), is gradually believed to have led to the development of the science of Ayurveda.

During the ancient time, the four most respected personalities in Ayurvedic medicine included Atreya, Charaka, Susruta and Vaghbata. Atreya lived around 800 BC and practised and taught Ayurveda from the University of Taxila which is about twenty miles west of Rawalpindi. Ayurveda science developed very well during the regime of king Ashoka (226 BC) and other Buddhist kings. They established Ayurvedic schools of medicine and hospitals. Charaka (AD 200), was a famous Ayurvedic physician to the Buddhist king, Kaniska. He wrote a famous volume called "Charaka Samhita". Another physician called Susruta of Banaras wrote a famous volume describing the surgical knowledge existing that time. This volume is called "Susruta Samhita" and is the main source of knowledge about surgery in ancient India. According to this volume, the ancient Indians did surgery of amputations, corrected the fractures, hernias and removed certain tumours and cataract. During the Buddhist time, Indian surgery suffered a setback because of the doctrine of 'Ahimsa' (Non-violence). Ayurveda developed the 'tridosa theory of disease' which states that the disease occurs because of the disturbance in the equilibrium of the three factors in the body namely, the vayu, pitta and kapha.

The archaeological excavations at Mohenjodaro, Harappa and Lothal have revealed an advanced knowledge of sanitation, water supply and engineering. This proves that hygiene played an important role in ancient Indian medicine. During the Moghul and subsequent period, Ayurveda declined due to lack of state support.

The other systems of medicine which were prevalent during the ancient period and which are in practice even today are "Unani-Tibb" and "Homeopathy". The "Unani-Tibb" system originated from the ancient Greek medicine and was practised in Delhi, Aligarh, Lucknow and Hyderabad. It enjoyed state support from successive Muslim rulers in India till the advent of the British in the 18th cent. Homeopathy, which was founded by Samuel Hahnemann (1755–1843) of Germany acquired its roots in India during 1810–1839.

Chinese Medicine: Chinese medicine originated as early as 2700 BC and it is based on two principles, 'YANG and YIN'. The Yang is believed to be an active masculine principle and Yin is believed to be a negative feminine principle. They believed that the disease occurs due to an imbalance between these two opposing forces. Hygiene, dietetics, hydrotherapy, massage and drugs were all used by the Chinese physicians. Chinese were early pioneers of immunization and they believed that a great physician is one who treats not someone who is already ill but someone who is not yet ill. The Chinese system of 'acupuncture anaesthesia' has attracted worldwide attention in the recent times.

Egyptian Medicine: Amongst the ancient doctors, Egyptians were considered as the best and they practised it from around 2000 BC. The Egyptian medical manuscript called the 'Ebers papyrus' is well known and it contains a record of about 800 prescriptions based on about 700 drugs. They believed that the diseases occur because of absorption from our intestine, of some harmful substances which cause putrefaction of blood and formation of pus. They used to treat

the diseases with cathartics like castor oil and senna, with enema and bloodletting. They knew the importance of mosquito nets and the association of plague with rats. There is evidence that they also used chemicals like gentian violet, copper salts, turpentine and tannic acid in their medical practice. Egyptians also practised specialised medicine. There were eye doctors, head doctors and tooth doctors. They also had good knowledge of public health and they built planned cities, underground drainage systems and public baths. Their medicine occupied a major place in the ancient world for about 2500 years, when it was replaced by Greek medicine.

Greek Medicine: The Greeks who are called the civilizers of the ancient world gave a new scientific direction to the medical practice and separated it from the magic and other superstitious medicinal ways. Aesculapius (1200 BC) was one of the earliest Greek physicians and his daughter, Hygiea was, therefore, worshipped as the goddess of health. The Greek physician Hippocrates, is regarded as the father of medicine and his famous oath, the "Hippocratic oath" is the base of medical ethics even today. Hippocrates showed the interrelation between the disease and habits of eating and drinking, climate, clothing, nutrition and the water supply. They believed that the disease occurs because of the disturbance of the body fluids namely the blood, phlegm, and the bile. When Greek civilization collapsed and was succeeded by Roman civilization, it paved the way for the development of Roman medicine.

Roman Medicine: The Romans acquired their medical knowledge from the Greeks, after conquering them. They had good sewage system knowledge, drained marshes to fight malaria and brought pure water to all their cities and established hospitals for the sick. Their important medical personalities included:

- i. Celsus (25 BC to AD 50), who described the cardinal signs of inflammation.
- ii. Galen (AD 130–205) was the pioneer of experimental medicine and wrote about 500 articles on medical subjects. His writings were accepted as standard medical textbooks for many centuries after his death.

Middle Ages: The period between AD 500–1500 is known as the 'middle ages'. With the fall of the Roman empire, the medical schools established by Romans also disappeared. The practice of medicine reverted back to the primitive methods, dominated by superstitions and magic. The dissection of human body was prohibited and hence there was no progress in medicine. This medicinal period is therefore called "THE DARK AGES OF MEDICINE".

During this period the Arabs translated the Greek and Roman medical literature into Arabic and helped to preserve the ancient knowledge. They called their system of medicine as the "Unani system of medicine". They also founded medical schools and hospitals in Baghdad, Cairo, Damascus and other Muslim capitals. The two great Arab physicians included:

- i. Rhazes (865–923), who described the differences between smallpox and measles.
- ii. Avicenna (980–1037), who was the first to describe guinea-worm.

The greatest contribution of Arabs was in the field of pharmacology. They introduced

many drugs namely camphor, benzoin etc., which turned out to be excellent remedies. The words drug, alcohol, syrup and sugar are all Arabian. The golden age of Arabian medicine was between AD 800–1300.

During the middle ages Christianity also exerted a great influence on medicine by establishing religious institutions known as “Monasteries” headed by religious leaders known as monks and saints. These monasteries rendered a great medical and nursing help to the sick.

Revival of Medicine: The period following AD 1500 saw the human knowledge advancing in all fields, specially in medicine. Fracastorius (1483–1553) put forward the ‘theory of contagion’, in which he explained the cause of epidemics. He thus became the founder of epidemiology. Vasalius (1514–1564), did lot of dissections on the human body and demonstrated some of the errors of Roman physician Gallen. Ambroise pare (1517–1590) studied surgery and became the father of modern surgery. “The United Company of Barber Surgeons” was established in England in 1540, which later on became the Royal College of Surgeons.

The following centuries saw even more spectacular discoveries, namely:

- i. Harvey’s discovery of the circulation of blood (1628)
- ii. Leewenhoek’s microscope (1670)
- iii. Edward Jenner of England discovered vaccination against smallpox (1796)
- iv. Laennes’s Stethoscope (1819)
- v. Robert Koch’s postulates (1882), the discovery of tubercle bacillus
- vi. Louis Pasteur’s antirabies vaccine (1885)
- vii. Joseph Lister introduced antiseptic surgery and before its introduction operations were virtually prohibited because of the risk of infection.
- viii. Professor Roentgen discovered X-rays in 1895, which were put to clinical use in 1904.

The above mentioned bacteriological and radiological discoveries completely revolutionised the diagnostic knowledge of different diseases.



Photograph showing manipulation of the hip for dislocation in the 17th cent. Since X-rays were unknown, surgeons were ignorant of whether they were dealing with a fracture or a dislocation. Also the patient had to be tied down to prevent movement of the patient during the painful procedure as anaesthetics had still not been discovered.

The birth of the 'Public Health' occurred for the first time around 1840 in England. The English Government passed 'Public Health Act' in 1848 and accepted that the state is responsible for the health of the people. By the beginning of the 20th cent. many western countries followed the English pattern of public health. The fight against infectious diseases led to the development of a series of vaccines namely Cholera vaccine in 1892, Typhoid vaccine in 1898, BCG in 1921, Whooping cough (Pertussis) in 1930, Yellow fever vaccine in 1936, Polio vaccine in 1955, Influenza vaccine in 1960, and the more recent Mumps, Measles and Rubella (MMR) in 1970 and Hepatitis B vaccine. The search is now on to discover vaccines against Malaria, Leprosy, Syphilis, Cancer and AIDS. The research on nutrition has led to the better understanding of the role of vitamins, minerals, trace elements and proteins in the prevention of disease and promotion of health. The discoveries of various antimalarials, antituberculous drugs, antileprosy drugs, latest antibiotics and anticancer drugs have made people to live longer in the recent years. This along with the population explosion specially in the developing countries have led to the complex economic and environmental problems. Population control along with occupational disorders, autoimmune diseases, Cancer, cardiovascular diseases and AIDS are of great concern to the medical field today. These can only be tackled by proper education of the masses, raising the economic standards of the people and the screening for the detection of the disease in its presymptomatic stages.

Finally, I would like to mention something about Marine Pharmacology, which has an immense hidden potential. Marine Pharmacology has a long history dating back to the Egyptian era, when attention was paid to puffer fish toxin, which was used to fight princely rivalries and royal disputes. Attention to pharmacologically active substances in the sea was first drawn by Emerson & Taft in 1945. In 1969 an excellent book on "Marine Pharmacology" was published by Moris Baslow of Hawaii School of Medicine. As far as the Indian scene is concerned, a serious effort for exploration of marine flora & fauna was made only in the last 8 years with the collaborative effort of our National Institute of Oceanography, Goa, CDCRI, Lucknow and Bose Institute, Calcutta. The joint effort has resulted in broad-based biological screening of several marine samples which have been found to possess promising biological activities, which are shown in the following table 1.

Table 1: Showing important chemicals and drugs isolated from the oceans.

Drugs and chemicals with pharmaceutical potential:

1. Prostaglandin.

2. Antimicrobials like Cephalosporins, Lonophore, antibiotics like Acanthifolicin, Okadaic acid and Aplasmomycin.
3. Laminaria tent
4. Anticancer + cytotoxic drugs like Arabinosides isolated from soft corals.
5. CVS active drugs like:
 - i. Hypotensives
 - ii. Cardiotonic
 - iii. Hypolipidemic
 - iv. Anticoagulants
 - v. Autonomic agonists and antagonists.
6. Anti-inflammatory drugs like Flexibilide from coral *Sinularia flexibilis*, Dandolone from sponge *Phyllospongia Dendyi*.
7. Antispasmodics like Indole alkaloids, Flustramine A & B isolated from Swedish marine organism, *Flustra Foliaeae*.
8. Antifungal like Cyanophytine from blue-green alga *Trichodesmium Erythreum*, Ptilocaulin from *Ptilocaulis Spiculifer*, Terpinoids from sponges like *Dysidea*.
9. CNS active:
 - i. CNS Stimulants
 - ii. Antidepressants
 - iii. CNS depressants
 - iv. Neuromuscular blockers
 - v. Muscle relaxants
10. Miscellaneous
 - i. Enzyme inhibitors like Dactylone obtained from sea hare (*Alysia Dactylomela*). It potentiates pentobarbitone sleeping time.
11. Marine toxins
 - i. Red tide toxins produced by Dinoflagellates.
 - ii. Palytoxin isolated from *Palythoa* species, is one of the most potent coronary vaso constrictor. It also inhibits sperm motility.
 - iii. Brevetoxins: produced by *Ptychodiscus Brevis* is both neurotoxic & haemolytic.
 - iv. Ciguatera toxin: originating from the Dinoflagellate *G. Toxicus*. It brings about respiratory depression.

Future Work

Work done in our country so far has been quite promising. The Department of Ocean Development of Govt. of India has therefore taken up a 3 year National Project on 'Development

of Potential Drugs from the Ocean'. These ongoing research projects coupled with the knowledge already acquired of highly active and novel marine molecules offer a challenge full of hope, which can be met only by an aggressive and determined dip into the sea. There is no doubt whatsoever that new drugs in the 21st cent. will emerge from the ocean.

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