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CONVENTIONAL METHOD OF DRUG DESIGN AND DISCOVERY

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ABSTRACT

The process of drug discovery is very complex and requires an interdisciplinary effort to design effective and commercially feasible drugs. The objective of drug design is to find a chemical compound that can fit to a specific cavity on a protein target both geometrically and chemically. After passing the animal tests and human clinical trials, this compound becomes a drug available to patients. The conventional drug design methods include random screening of chemicals found in nature or synthesized in laboratories. The problems with this method are long design cycle and high cost. Modern approach including structure-based drug design with the help of informatics technologies and computational methods has speeded up the drug discovery process in an efficient manner. An improved generation of software's with easy operation and superior computational tools to generate chemically stable and worthy compounds with refinement capability has been developed. These tools can tap into cheminformation to shorten the cycle of drug discovery, and thus make drug discovery more cost-effective. The conventional drug discovery and development also include the traditional methods of drug discovery and development which contains the medicinal systems like Ayurveda, Homeopathy, Siddha and Unani. This chapter gives a brief view about the random screening, serendipitous drug discovery, trial and error method and ethno pharmacological

approach and classical pharmacological aspects in conventional drug discovery methods. The chapter also include the target identification and validation.

KEYWORDS: Random screening, ethanol pharmacology, traditional, Ayurveda, serendipity, classical pharmacology.

Drug discover & drug design

In the past most drugs have been discovered either by identifying the active ingredient from traditional remedies or by serendipitous discovery.

But now we know diseases are controlled at molecular and physiological level. Also shape of molecules at atomic level is well understood. Information of human genome.

New drugs are developed through drug discovery. Drugs were formerly discovered mostly through discovering active components in traditional medications or by pure accident. Following that, traditional pharmacology was employed to look through chemical libraries containing small compounds, natural products, and plant extracts in order to locate those with therapeutic properties. Since the sequencing of human DNA, reverse pharmacology has used testing to find cures for existing ailments. Through the loop below, disease processes, molecular compound assays, existing treatments with unanticipated side effects, and new technology promote drug discovery. Drug discovery nowadays entails hit screening, medicinal chemistry, and hit optimization to limit potential drug side effects (increasing affinity and selectivity). This stage of the medication development process also improves efficacy or potency, metabolic stability (half-life), and oral bioavailability.

Target identification & validation

A gene or protein (therapeutic agent) that plays a substantial impact in disease is identified as a target. Therapeutic qualities are noted once they have been recognized. Targets must be effective, safe, and drug-like, as well as meet clinical and commercial objectives. To validate

targets, scientists use disease associations, bioactive chemicals, cell-based models, protein interactions, signalling pathways analysis, and gene functional analysis, as well as in vitro genetic manipulation, antibodies, and chemical genomics. Drug development targets can be found in the Sanger Whole Genome CRISPER library and the Duolink PLA.

Hit discovery process

Following target validation, compound screening assays are developed.

Assay development & screening

Assays are test systems that assess the new drug candidate's effects at the cellular, molecular, and biochemical levels.

Hit throughput screening

High Throughput Screening (HTS) uses robotics, data processing/control software, liquid handling equipment, and sensitive detectors to run millions of pharmacological, chemical, and genetic tests in a matter of minutes, saving scientist’s hours of tedious testing. HTS is a technique for detecting active chemicals, genes, or antibodies that alter human molecules.

Hit to lead

Small molecule hits from an HTS are reviewed and improved in a restricted way into lead compounds in the Hit to Lead (H2L) process. The lead optimization procedure is then applied to these compounds.

Lead optimization

The lead compounds discovered in the H2L method are produced and tweaked in the lead optimization (LO) process to boost potency and reduce negative effects. Lead optimization designs the drug candidate by conducting experimental testing utilizing animal efficacy models and ADMET tools.

Active pharmaceutical ingredient

APIs (active pharmaceutical ingredients) are physiologically active chemicals in a drug candidate that have a therapeutic impact. The API or APIs, as well as excipients, make up all medications. (Excipients are inactive ingredients that help the medicine enter the human body.) HP APIs (High Potency Active Pharmaceutical Ingredients) are compounds that work at substantially lower doses than normal APIs. They're categorized by toxicity,

pharmacological potency, and occupational exposure limits (OELs), and they're employed in multi-step drug development.

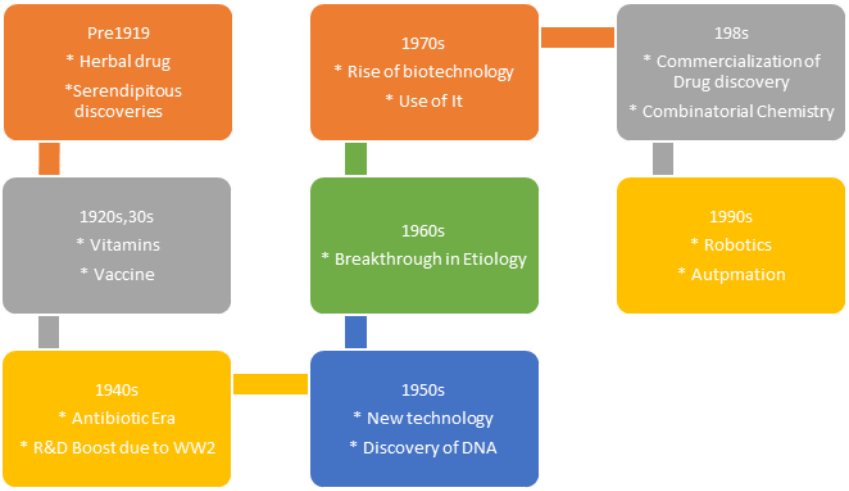

Fig: progresses in creation of new drug.

Random screening (hts- high throughput screening)

Random screening (HTS) refers to the integrated protocols used in the pharmaceutical industry to evaluate millions of chemicals annually in numerous bioassay in the quest for new leads. In general any random screening or HTS method starts with the set of compounds, which are commonly found in the form of librarype of pre-plated DMSO stock solution. Following the addition of reagents and incubation, these compound mother plates are used to transfer compounds to an assay plate, where the biological test is conducted and the assay signal is assessed. The data is being saved in a relational data base that connects the chemical structure of the biological activity (depending on the assay format). A library comprising relevant compounds for the target class as well as enough knowledge about the target to link activity through direct or indirect perturbation of macromolecule, are required for random screening (HTS) studies. The result of these research are typically powerful and selective scaffolds that can be further optimize using standard medicinal chemistry techniques. Chemical limitations, such as Lipinski's guidelines and opera's lead like criteria, are typically applied to compounds in traditional HTS. Because of concerns regarding unfavorable impacts on assays or biological activity, some functional groups are routinely eliminated from screening compounds. Finally in the protocol calls for searching of new targets using the "most varied" selection of molecules possible (Shelat and Guy,2007).

In random screening (HTS), there are two types of bioassays: cellular and biochemical. The fomar uses whole, live cells, while the later uses isolated proteins. Cell based assays are particularly useful for discovering receptor agonist (since receptor function can be directly measured) and for drugs that interact with ion channels, particularly if activity- state modulators are of relevance. For intra cellular target, biochemical screening is especially useful. They are easier to perform, have less data scatter, can be done at greater compound concentrations, and can provide a wider number of chemical starting points for intracellular targets. Biochemical tests are further classified into screening heterogeneous or Separation-based assays (in which the reaction product is detected after separation from the starting material) and homogenous assays (in which the product is detected before separation from starting material). The majority of homogeneous tests rely on proximity sensing in some way. Separation-based assays feature broader signal windows then homogeneous assays, reduce compound interference effects, and limit the substrate concentration that can be utilized in the experiment. Because there are fewer addition or reagent-transfer steps in homogeneous tests, they are easier to automate and miniaturise. Reduced test complexity can also assists reduced assay data scatter (Walter and Namchuk).

Traditional random screening (HTS) has been used to successfully identify voltage-gated sodium channel inhibitors using a fluorescence imaging plate reader (FLIPR) assay (Benjamin et al., 2006), a fluorescence resonance energy transfer (FRET) assay for inhibitors of polyglutamine aggregation (Desai et al., 2006), and a fluorometric microtubule cytotoxicity assay for detecting compounds that are selectively cytotoxic to malignant (Rickardson et al 2006)

Trial and error method

Traditional techniques of illness prevention, diagnosis, and treatment are connected with a number of diagnostic mistakes as well as minor to severe drug-related side effects. Because it's unclear why some treatments don't work for some patients or produce major side effects in others, most doctors utilise a 'trial and error' approach to prescribe, adjust the dose, or even change the drug.(qazi najeeb 2012).

A fundamental way of problem-solving is trial and error. It is characterized by frequent, varied attempts that are continued until the practice succeed.

Ethno pharmacological approach in drug discovery

Drug development investigations are required due to the presence of the numerous disorders for which there is no appropriate treatment. The results of research and development projects are inconclusive. To make up the foundation of drug discovery research industries involved in pharmaceuticals. There are numerous chemicals that must be examined. Before registering a new product, it must be thoroughly studied. The screening methods that were employed to look into the plant-based chemicals can also be developed to be effective. Either by deciding which plant materials to use as candidates by chance or by identifying a potential candidate by utilizing databases created specifically for this purpose. These procedures, on the other hand, are costly, time-consuming, and ineffective. And low-productivity processes that produce low-quality results. A high success rate methods of screening with a high throughput, technology in genomics and combinatorial chemistry are employed in order to preserve therapeutic innovation. The majority of a wide range of random screening procedures were implemented. The National Cancer Institute in the United States and the National Drug Research Institute in India.

This concept was described by Bruhn and his colleague Holmstedt in 1981 as the multidisciplinary scientific investigation of biologically active agents that have been used or observed in the past. This agents come from variety of places like animals, microbes, and marine life are all examples of plants, organisms, as well as other biological and inorganic materials. When ethnopharmacological research are taken into consideration, medicinal plants have a huge influence. It's obvious plant based biologically active substances are used in this study. Agents can be applied to entire plants, specific plant portions, or individual plant parts or herbal drug formulations (for example essential oils, extracts, fractions, etc) or active pharmaceuticals produced from plants. This is determined by active section of the plant in which all of the component are sometimes found act in concert to demonstrate a common theme biological action, although only one chemical may be present at a time can be held accountable for bioactivity. Herbal remedies are effective. A vast spectrum of chemicals can be found in raw materials and crude extracts. Compound(s) that function together or separately to give you a polypharmacy effect. Synergy is a banefit; When a single action is expected to provide the same results from a single compound. This may have unintended consequences as (a result of the larger dose, there are more side effects.

Serendipity in drug discovery

What is serendipity?

Serendipity refers to Ceylon, which is today known as Sri Lanka. The word "serendipity" comes from a Persian fairy tale called The Three Princes of Serendip, in which the protagonists are "constantly making discoveries, by accidents and sagacity, of things they were not in search of." 1 The story was translated from Persian to Italian and then from Italian to French in the 16th century. In a letter to his friend, Horace Mann, dated June 28, 1754, Horace Walpole (1717-1797), an English man of letters, came across it in a collection of oriental tales in French and coined the English phrase "serendipity." (Hoffman R. 2006).

Serendipity is one of several elements that can influence drug development. It was involved in the discovery of prototype psychotropic medicines, which led to current psychiatric pharmacological treatment. It has also aided in the discovery of several drugs that have influenced the development of psychiatry. In drug discovery, "serendipity" refers to the discovery of one thing while looking for something else. This was the case with six of the twelve serendipitous discoveries discussed in this paper, namely aniline purple, penicillin, lysergic acid diethylamide, meprobamate, chlorpromazine, and imipramine; in the case of three drugs, namely potassium bromide, chloral hydrate, and lithium, the discovery was serendipitous because an utterly false rationale led to correct empirical results; and in the case of three drugs, namely The discovery of bromide, chloral hydrate, and lithium was serendipitous because an entirely erroneous logic led to correct empirical results; whereas the discovery of ironized and sildenafil was serendipitous since valuable indications for these medications were discovered that were not initially sought. One of the twelve medications, chlordiazepoxide, was discovered by chance.

The story begins in 1856 with an 18-year-old English chemist named William Henry Perkins (1838-1907), who was trying to synthesize quinine and ended up with a bluish substance with excellent dyeing properties that he extracted from a "black mess" in his test tube.10 Perkins' discovery of the first artificial dye in history, referred to variously as aniline purple, tyrian blue, or mauve, triggered a chain reaction by serendipity 7 Many dyes and the dye industry were developed as a result of modifications to his procedure, such as Bayer (1862), Ciba (1859), Geigy (1859), and Sandoz (1859). (1862). the realisation that a fuller exploitation of his discoveries would necessitate the establishment of a new breed of chemist12 provided a powerful drive for the development of organic chemistry. 13,14 The pharmaceutical industry

arose from the synthesis of organic molecules. 15 Many dye businesses, such as Bayer (1896) and Ciba (1889),12 expanded their activities to include medicinal discovery by the end of the nineteenth century. Perkins' finding could not have happened by chance. August Wilhclm von Hofmann (1818-1892), one of the pioneers of aniline chemistry,16 taught him at the Royal College of Chemistry in London. and was aware that crystalline (a substance obtained by O. Unverdorben in 1826 by distillation of indigo) and kyanol or cyanol (a substance isolated from coal tar by K Runge in 1834 that produced a beautiful blue colour when treated with calcium chloride) were the same substance (phenylamine, with the formula C5H5NH2) that C. J. Fritzsche obtained by treating indigo with potassium chloride and named aniline) (The name "aniline" derives from the indigo-producing plant Indigofera anil; anil comes from the Sanskrit word "nile," which means "dark blue.") 17) His fortuitous discovery was based on his prior knowledge and experience. He was also well aware of the potential for his finding to be put to good use. (Thomas A. Ban 2022).

Some examples of the serendipitous drug discovery

1) Bromide of potassium
2) Hydrate of chloral
3) Penicillin as antibiotics
4) Acetanalide

Classical pharmacology

Classical pharmacology, also known as forward pharmacology, (backmann K A 2009) or phenotypic drug discovery (PDD), is based on phenotypic screening (screening of chemical libraries of synthetic small compounds in intact cells or complete animals) in the science of drug development. to find compounds with a desired therapeutic effect using natural ingredients or extracts. The potency, selectivity, and other qualities of a drug are measured using medicinal chemistry techniques. These screening hits have been fine-tuned to yield medication candidates.

The discovery of novel medications has historically been based on classical pharmacology. Compounds are tested in cellular or animal models of disease to see if they cause a desired phenotypic change. Only when the chemicals have been discovered can an analysis be performed. Through target validation, an attempt is made to determine the biological target of the chemicals. Chemo proteomics is frequently used in investigations. It has recently become fashionable to develop a notion that a certain biological target can be used to treat disease,

and then look for chemicals that can help modulate this purified target's activity. Following that, these chemicals are put to the test in animals to see if the desired result is achieved This method is referred to as "reverse pharmacology"] (Takenaka 2001) or "drug discovery based on targets"

The discovery of tamsulosin was a watershed moment in the history of medicine

Caine et al.[1] reported in a small-scale clinical research in 1975 that phenoxybenzamine, an antihistamine, was effective. Treatment of symptomatic BPH with an a-adrenoceptor (aAR) antagonist was successful. aARs were not common at the time. A1 and a2 are the two pharmacological subtypes. a2. It was also discovered around the same time that the aAR that regulates human prostatic contractions. The a1-subtype was smooth muscles. Taking action in response to these Yamanouchi Research and Development began in the year 2000. With the goal of finding a novel type of a1-blocker notion that a selective a1-blocker may be developed into a treatment a treatment for the voiding disorder that comes with BPH is a condition that affects men. Isoproterenol, a b-receptor agonist, was chemically modified to produce b-adrenoceptor antagonist a similar approach while developing a new a1-antagonist by manufacturing and evaluating a large number of derivatives of noradrenaline, an a1-agonist. A powerful and selective derivative was selected from among these derivatives. Tamsulosin, an a1-antagonist, was found. Tamsulosin is a new a1-blocker chemical class with a structure Prazosin's effect is not the same as prazosins. Tamsulosin's mechanism of action is being investigated.

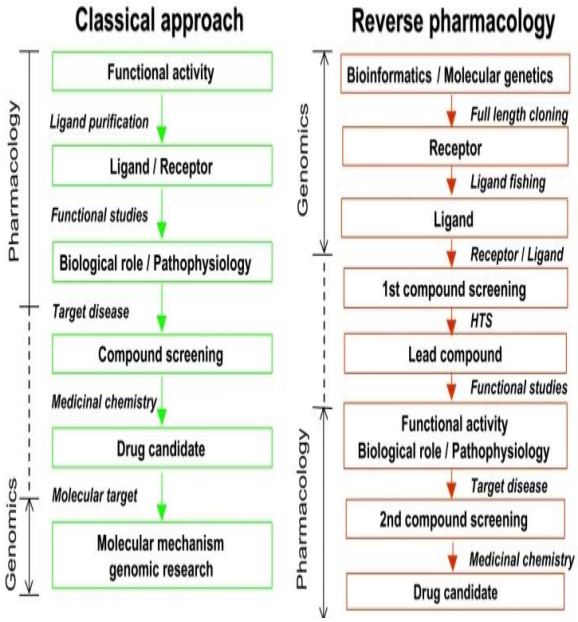

Fig.: Diagramical representation of classical approach and reverse pharmacology.

Traditional Method

In most countries, traditional medicine (TM) is employed alongside conventional medicine in basic health care systems. As a result, the efficacy and safety of TM should be thoroughly investigated. For better health-care services Evidence is extremely important right now. Clinical medication development based on shifting global economic conditions scene. It is critical to use TM candidates when creating new medications. Whenever possible, to consider new standard parameters Quality The ability to control TM is also a requirement of regular clinical trials. When pursuing a clinical herbal product development cycle based on evidence It is vital to adhere to current quality control standards. GLP (Good Laboratory Practice) and GMP (Good Manufacturing Practice) are two examples of good laboratory practice. GMP stands for Good Clinical Practice (GCP) and stands for Chemistry, Manufacturing, and Production. Pharmaceutical Quality or Controls (CMC).

Some conventional methods of drug discovery

1) AYURVEDA
2) SIDDHA
3) UNANI
4) HOMEOPATHY

1) Ayurveda

In Sanskrit Ayu means life, while Veda means knowledge or science.

Ayurveda is one of the oldest and most frequently practised living traditions in India, Sri Lanka, and other nations, with a sound intellectual and experiential foundation.

Principle

The five basic components and tridoshas are at the heart of Ayurveda's philosophy. The universe, according to Ayurveda, is made up of five basic elements (Panchamahabuthas). The material world, plant kingdom, and all other living things are all part of the universe beings. To put it another way, these five components are the building blocks of all matter Akasha (ether), Vayu (air), Agni (fire), Jala (water), and Prithvi (earth) are the five elements.(Chopra, A. and Doiphode).

Tridoshas

The five elements combine to form “Tri Doshas” i.e. Vata, Pitta, and Kappha. They are the “Basic Forces’’ and also known as the “Pillars of Life”

1. Vata (Air principle) the elements ether and air
2. Pitta (Fire principle) the elements fire and water
3. Kapha (Water principle) the elements earth and water

According to the Ayurveda, sickness is due to the imbalance of any one or more of the three doshas. E.g. Aggravation of Pitta leads to indigestion, skin diseases and liver problems.(Bhushan Patwardhan)

Ayurveda, which originated in India, is founded on Sankhya philosophy, which translates to "rational inquiry into the nature of the truth.

In Ayurveda, life is defined as the union of the body, senses, mind, and spirit. soul. Prakriti, or human constitution, is a crucial notion. Ayurveda plays an important role in understanding health and disease.

The principal texts are the Atharvaveda (about 1200 BC), Charak Samhita, and Sushrut Samhita (1000–500 BC). Over 700 herbs are described in depth in these classics. A current scholarly description of Caraka's legacy, best undertaken with a commentary from From the standpoint of current medicine and science, ancient knowledge glimmers. The Indian healthcare system is made up of despite medical pluralism, ayurveda still reigns supreme as compared to modern medicine, especially in terms of therapy of a wide range of chronic illnesses India has. There are around 45,000 plant species with therapeutic potential. Thousands of people have been allocated to them. A total of 2000 have been discovered. in the scientific literature; Typically, 500–700 people work in indigenous systems. Commiphora species (used as a hypolipidaemic agent) and Picrorhiza species have been the subject of contemporary pharmacological development (which is hepatoprotective), Curcuma longa, Bacopa longa, Bacopa longa, Bacopa longa, Bacopa longa, Bacopa (antiinflammatory).

Diagnosis

In Ayurveda diagnosis is always done of the patient as whole. Diagnosis is carried out to find out which dosha is aggravated. For his purpose, Ayurveda diagnosis is done by questioning and by undertaking 8 studies including nadi(Pulse), tongue, skin, physical features, stool, urine etc. are determined.

Treatment

Treatment includes preventive and curative measures. Preventive measures include personal hygiene, regular daily routine, appropriate social behavior. The curative measures include three major measures including aushadhi i.e. drugs, Anna i.e. diets and vihar i.e. exercise and general mode of life. The curative treatment consists of Aushadhi (drugs), Ahara (diet) and Vihara (life style). Ayurveda largely uses plants as raw materials for the manufacture of drugs, though materials of animal and marine origin, metals and minerals are also used.

Panchakarma is a different therapeutic procedure for the radical elimination of disease-causing factors and to maintain the equilibrium of humors. Panchakarma include 5 detoxification processes, used to treat diseases, according to Ayurveda.

1. Vamana (Medicated emesis),
2. Virechana (Medicated purgation),
3. Basti (Medicated enema),
4. Nasya (medication through the route of nose),
5. Raktamokshana (Bloodletting)

The Panchakarma therapy reduse the chances of recurrence of the diseases and promotes positive health by rejuvenating body tissues and bio-purification.

The importance of treatment is to restore the balance and harmony of doshas with proper diet and drugs. Selection of the drugs Based upon.

1. Rasa (Taste),
2. Virya(Potency)
3. Vipaka (Taste after digestion)

2) Siddha

Siddha medicine is one of India's oldest medicinal traditions. Siddha is the mother medicine of the peninsular South Indian Tamils/Dravidians. Siddha is a Sanskrit word that means "confirmed truth." (Tamil: Siddhi) is what the term "Siddha" means that is to say philosophy, yoga, and wisdom are examples of achievements in living arts.

Great philosopher and physicians are known as Siddhars. The main sources of Siddha medicine come from religious organisations known as 'Kayasiddhars,' who place a strong emphasis on the body. Yoga, alchemy, and medicine are all used to achieve "body

perfection" and its relationship to man by their yogic awareness and experimental findings. They postulated the concept of spiritualism for self-improvement, and the practices initiated by them came to be known as the SSM. SSM has been in existence and is being practiced for the past 2000 years (Thas, 2008); however the printed Siddha literatures are available from the 18th century onwards and before that they were documented on palm leaves by different authors (Sampath 1983), "Agasthiyar" has made the most contributions to the development of SSM and is regarded as its founder. "Hippocrates of Siddha Medicine," one of the most illustrious figures in Siddha Medicine, Indian philosophers (Sampath, 1983). His works include the following: still exist in regular medical and surgical texts, which can be found in the library. The siddha medical practitioners use it on a daily basis. There were some In the past, there were 18 significant siddhars, and they invented this medical method, which is why it is known as SSM.

Name of the Siddhas in order of their time period					
1.	Shri Pathanjali	2.	Shri Agasthiyar	3.	Shri Kamalamuni
4.	Shri Thirumoolar	5.	Shri Kuthambai	6.	Shri Korakkar
7.	Shri Thanvantari	8.	Shri Sundaranandar	9.	Shri Konganar
10.	Shri Sattamuni	11.	Shri Vanmeegar	12.	Shri Ramadevar
13.	Shri Nandeeswarar	14.	Shri Machamuni	15.	Shri Edaikkadar
16.	Shri Karuvoorar	17.	Shri Bogar	18.	Shri Pambaati

In Tamil, they chronicled their mystic discoveries in medicine, yoga, and astrology. The theories of the Five Elements (Aimpootham) and Three Forces/Faults are among Siddha's fundamental principles (Mukkuttram).To determine diagnosis, aetiology, therapy, and prognosis, the Eight Means of Examination (Envakai Thervukal) is employed. Psoriasis, eczema, alopecia, diabetic ulcer, warts, vitiligo, pemphigus, pompholyx, leprosy, and many more common and unusual disorders can all be treated safely using Siddha's herbal and herbo mineral treatments. Dietary changes, as well as lifestyle changes, are critical.

Basic ideas of the Siddha system of medicine

The human body, according to SSM, is made up of 96 variables (Tamil: Thathuvas), which include physical, physiological, and psychological components. Aspects of psychology and cognition there are 72,000 blood cells in the body. There are 1300 veins and 1300 nerves in the body, and the total number of disorders is 4,444. Apart from these, there are ten major arteries (Tamil: Naadi), Ten vital pranas (Vayu in Tamil) and ten natural functions (Vayu in Tamil) Vegangal). All of these are regarded to be significant in the body's various functions (Walter, 2005). The Siddha is a type of Buddhist monk.

The four fundamentals are demanded of a practitioner. (World Health Organization, 2005)

1. Alchemy: is a term used to describe the process of creating something from nothing (Tamil: Vaatham)
2. Medicine: is a word that has a lot of different meaning (Tamil: Vaithiyam)
3. Yoga: is a type of exercise that may be done anywhere (Tamil: Yogam)
4. Philosophie: (Tamil: Thathuvam)

The use of metals such as gold, silver, iron, lead, and mercury, as well as coral and pearl extracts, is a unique aspect of siddha medicine, which promises to detoxify metals to allow for better health. They'll be utilised to treat disorders that are difficult to treat.

Principles of treatment

The SSM is a psychosomatic system, where attention is given to minerals and metals along with the plant constituents (Mukherjee, 2001). The treatment in siddha medicine is aimed at keeping the three humors in equilibrium and in the maintenance of the seven elements. Therefore, proper diet, medicine and a disciplined regimen of life are advised for a healthy living and to restore equilibrium of humors in a diseased condition. According to the SSM, various internal and biological features of your appearance are assigned to the blend of seven elements viz., plasma, blood, muscle, fatty tissue, bone, nerve and semen (Ayu, 2012). Siddha system follows the ashtanga concept with regards to treatment procedures. However, the main emphasis is on the three branches, namely pediatrics (Tamil: Bala vahatam), toxicology (Tamil: Nanjunool) and ophthalmology (Tamil: Nayana vidhi). The other branches have not been developed to the extent seen in Ayurveda. The surgical procedures, which have been explained in great detail in the ayurvedic classics, do not find mention in the siddha classics. The therapeutics in both the systems can be broadly categorized into samana and sodhana therapies. The latter consists of well-known procedures categorized under panchakarma therapy. This therapy is not that well developed in siddha system, only the vamana therapy has received the attention of the siddha physicians (Narayanaswamy, 1975).

SSM's current treatment status

The SSM is thought to be capable of treating a wide range of ailments, but it is especially helpful in chronic cases of peptic ulcer, liver, anaemia, prostate hypertrophy, piles. It can also be used to treat skin problems and arthritis.

Siddha has recently been proven scientifically and empirically. that it involves viral load assays and CD4+/CD8+ ratio testing . Is more effective in HIV/AIDS treatment .which alleviates the disease's devastating. It's also been shown to help in healing. HIV/AIDS positive people and those who have sexually transmitted infections (STD). Cancer (Tamil: Putrunoi) and diabetes are two other diseases.(Neerazhivu in Tamil).[8]

3) Unani

The Unani System of Medicine is one of the oldest traditional medical systems, with a long history of success in the prevention and treatment of a wide range of medical disorders. Ionian, or Greek, is referred to as Unani in Arabic. Unani medicine is also known as Unani Tibb in popular culture or Graeco-Arab Medicine, as Arabs created and practised it. It was refined by methodical experimentation, most notably by Avicenna. The origins of Unani Medicine can be traced back to the Greeks. Four humours are used to define good health. In The Unani system of medicine is used throughout the countries of South Asia. Since centuries, medicine has been quite popular with other established medical systems currently, the Both are supported and subsidised by the Indian government. Ayurvedic and Unani medical schools and hospitals are available. However, whereas Ayurveda has a long and illustrious history. Unani Medicine still has a long way to go in terms of popularity. Perhaps because of its minority Islamic population, it has gained recognition associations.

The seven basic physiological concepts are taught in this doctrine (al-umoor al-tabiyah). The health of a person is determined by the notion of Unani medicine. Alumoor al-tabiyah, the seven basic physiological homeostasis, maintains the eqiuilibrium of the human body. The Unani doctrine's principles.

(1) arkan,
(2) mizaj, or temperament,
(3) akhlat, or character humours,
(4) aza (organs),
(5) arwah (vital spirit)
(6)quwa, or faculties or capacities
(7) afal, or functions,

These seven physiological principles must be in balance retain the body's natural constitution. The constitution of an individual has the ability to self-regulate or Tabiyat (or mudabbira-e-

badan) is a form of power. Immunity to keep the seven components together is interpreted as equilibrium.

Treatment's fundamental principle

According to Unani Medicine, derangement is the primary cause of pathological alterations in an organ. In the quantity and temperament of humours that causes to the development of mawad-e-fasida (morbidity material). As a result, treatment measures try to restore by the counteracting the imbalance of several components. The effect of a disordered temperament that existed at the time of the event disease with drugs and nutrition, with Ilaj bittadbeer (regimenal therapy) as a support, and finally raddi expulsion istafraag (evacuation) from akhlat (morbid humours) the human body. This aids in the restoration of normal homeostasis of humours, i.e. the body.

Since December 2019, a respiratory pandemic named as coronavirus disease 2019 (Covid-19) caused by a new coronavirus named as SARS-CoV-2, has taken the world by storm. The symptoms are fever, malaise, and cough which resolve in a few days in most cases; but may progress to respiratory distress and organ failure. Transmission is through droplet infection or fomites, but other modes such as airborne transmission and oro-fecal transmission are also speculated. Research is underway to develop effective vaccines and medicines for the disease. In such a scenario, we present the measures described in Unani system of medicine for health protection during epidemics. Unani is a traditional system of medicine developed during the middle ages, which employs natural drugs of herbal, animal and mineral origin for treatment. In Unani medicine, during an epidemic, apart from isolation and quarantine, three measures are of utmost importance, (i) purification of surroundings using certain herbal drugs as fumigants or sprays, (ii) health promotion and immune-modulation, and (iii) use of health-protecting drugs and symptom-specific drugs. Drugs such as loban (Styrax benzoides W. G. Craib), sandroos (Hymenaea verrucosa Gaertn.) za'fran (Crocus sativus L.), vinegar etc. are prescribed in various forms. Scientific researches on these drugs reveal the presence of a number of pharmacologically active substances, which may provide a new insight into the management of infections and epidemics.

Unani medicine's treatment modalities

In the Unani system of medicine, the following modalities of treating a sickness are accessible, depending on the condition the ailment's nature and causes.

a) Ilaj-bil-Tadabeer and Ilaj-bilGhiza/ Ilaj bil-Taghziya (Regional therapy) (Dietotherapy)

b) Ilaj-bil-Dawa (Pharmacotherapy)

c) Ilaj-bil-Yad (Surgery)

The first one of a suitable regimen from i.e. Ilaj-BitTadabeer wa ghiza (Regimenal therapy and dietotherapy) to normalise and balance the external factors (e.g., air, water, and food) involved in ailments and diseases is Ilaj-BitTadabeer wa ghiza (Regimenal therapy and dietotherapy). embraced and put to use If this isn't enough, ilaj-bildawa (pharmacotherapy) might be suggested. If these are the case measures appear to be ineffectual, ilaj-bil-yad can be used (surgery) is advised.

Many single and combined drugs are used in the Unani system of medicine to treat a variety of pathological conditions caused by abnormal blood, such as Wild Fig (Ficus hispida), Babchi (Psoralea corylifolia), Aatrilal (Ammi majus), Globe-Thistle (Echinops echinatus), Chaksu (Cassia absus), Chiraita (Swertia chirata), China root (Smilax (Ghani, 2001). The mechanism of action of these medications, which are used to treat a variety of dermatological problems, was thoroughly discussed by unani practitioners.

For centuries, aatrilal has been utilised in traditional medicine. It was contaminated and swapped with several medications due to disputes regarding its identity. Aatrilal's true identity as the fruit of A. majus L. has now been established. Despite having a wide range of pharmacological activity, it is the first-line treatment for vitiligo. Furanocoumarins (xanthotoxin, also known as 8-methoxypsoralen, bergapten, imperatorin, isopimpinellin) are abundant, as are flavonoids, terpenoids, proteins, essential oil components, and other chemicals. Anti-inflammatory, analgesic, antibacterial, antiviral, cytotoxic, and other properties have been documented. Clinical trials in vitiligo and other skin disorders have revealed therapeutic potential.

4) Homeopathy

Homeopathy is relatively a recent system of medicine. The word “Homeopathy” is derived from two Greek words Homois meaning similar and pathos meaning suffering.

Homeopathy is a specialized method of drug therapy curing a natural disease by administration of drugs. Homeopathy began in the late 1700s, developed by a German doctor named "Samuel Hahnemann".

Fundamental principles of homoeopathy

1. Law of Similia
2. Law of Simplex
3. Law of Minimum
4. Doctrine of Drug provingu
5. Theory of Chronic disease
6. Theory of Vital force
7. Doctrine of Drug-dynamization

Treatment

The treatment is based on the concept of proving and prover. Prover – The healthy person. Proving – The symptoms (Physical, mental, emotional changes) that are caused by the various potencies of medicines in prover.

The symptoms of the medicine are compared to the symptoms of the patient for treatment. In other words, the drug is chosen based on the drug's symptoms and the patient's condition. Homeopathic remedies are made up of naturally occurring ingredients. Minerals and plant extracts, for example. In order to prepare extremely low concentrations, in a precise manner Chronic disorders can be treated with homoeopathy in a definite and effective manner. Diabetes, arthritis, bronchial asthma, immunological disorders, and personality disorders dysfunction as well as mental illness.(In today's world, the most frequent ailment in women is anaemia. This syndrome can also occur during pregnancy. In my research, which miasmas are more prevalent during pregnancy and could be causing iron deficiency anaemia by using a homeopathic medicine.(enos cozt 2022).

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