



The Analytical Evaluation Of Novel Herbal Formulation: A Comprehensive Review

Onkar pawar¹, Radhika kotme²,

Department of pharmacy

Matoshri institute of pharmacy dhanore, Yeola, Maharashtra India ^{1,2}

Introduction:-

Due to its natural nature, fewer side effects, and discontent with the outcomes of synthetic pharmaceuticals, traditional herbal therapy and its preparations have been utilised extensively in both industrialised and developing nations for thousands of years. To the contrary, one of the traits the decoction procedure, all the herbal remedies, whether they are presented as single herbs or as groups of herbs in composite formulations, are extracted with boiling water. It's possible that this is the key factor behind why it's harder to monitor the quality of eastern herbal medicines than it is for western ones. According to the "General Guidelines for Methodologies on Research and Evaluation of Traditional Medicines" (World Health Organization, 2000), Inadequate or unaccepted research methodologies for evaluating traditional medicine are the main causes of the lack of research data, in addition to health care policy (WHO, 2000, 2001). In the past, vaidas treated patients on an individual basis and prepared medications based on their needs, but today the situation has changed, and are produced on a large scale, and manufacturers face a variety of challenges, including the need for good quality raw materials, the authentication of raw materials, the availability of standards, the need for proper standardization methodologies for individual drugs and formulations, the need for quality control parameters, etc.

Keywords:

Biological evaluation , organoleptic evaluation, chemical evaluation, physical evaluation, . Radio-immuno assay (RIA).

1. Drug evaluation:-

The evaluation of a drug entails verification of its identification as well as assessment of its potency and purity. There are three main reasons why evaluating crude drugs is necessary: biochemical variations in the drug, deterioration from handling and storage, substitution and adulteration as a result of negligence, ignorance, or fraud, or variability brought on by variations in growth, location, and harvesting timing. Traditional methods are obtained, researched, and documents and traditional information about identity and quality assessment are interpreted in terms of modern assessment or monograph in herbal pharmacopoeia for the purpose of quality control of a traditional medicine [Ansari, 2003; Kokate, 2004; Gupta, 2007]. There are five ways to assess or categorise the crude drug.

2 .Organoleptic evaluation or morphological evaluation:-

It refers to the evaluation of a drug using the sense organs (skin, eye, tongue, nose, and ear), also known as macroscopic evaluation. This method of qualitative evaluation is based on the analysis of the morphological and sensory profile of the entire drug. It includes the evaluation of a drug's colour, odour, taste, size, shape, and special features, such as touch and texture. eg. Important properties of cinchona, quillia, and cascara barks and quassia wood are their fragmented surfaces. Examples of this sort of evaluation include the sweet flavour of liquorice and the aromatic aroma of umbelliferous fruits, which depend on the type and quality of odorous components (volatile oils) present. Drugs' shapes might include cylindrical (sarsapilla), subcylindrical (podophyllum), conical (aconite), fusiform, etc., while their sizes correspond to their length, width, and height.

2. Chemical evaluation :-

The majority of medications contain defined chemical components that are responsible for their biological or pharmacological action. Chemical tests that are qualitative are used to identify specific drugs or check their purity. Chemical techniques of assessment are used for active constituent separation, purification, and identification. chemical tests that are qualitative, such as the acid value and saponification value. Some of these are helpful in evaluating gums (acetyl and ester values), volatile oils (acetyl and ester values), balsams (acid value, saponification value, and bester values), and resins (acid value, sulphated ash) (methoxy determination and volatile acidity). Chemical assessment includes preliminary phytochemical screening. These qualitative chemical assays can help with adulteration detection and chemical ingredient identification.

3. Physical evaluation:-

The evaluation of various medications occasionally includes consideration of physical constants. These include the amount of moisture present, specific gravity, rotational optical properties, refraction, melting point, viscosity, and solvent solubility. These physical characteristics are all helpful for identification, and the identification of plant components.

4 .Biological evaluation:-

Some medications have particular biological and pharmacological activity that is used to assess them. Actually, a particular sort of ingredient found in the plant extract is what's causing this action. The trials were conducted on both entire and isolated organs of living animals for assessment. The potency of a medication in its preparation may also be assessed with the aid of bioassays (testing the medicines on real animals) [Ansari, 2003; Kokate, 2005; Williamson, 1996]. Here are some significant biological assessments:

1.Antibiotic activity :-

The antiseptic value of several bacteria, including *Salmonella typhi*, *Staphylococcus aureus*, and *E. coli*, is evaluated (the degree of antiseptic activity e.g. phenol co-efficient of certain drugs). *Klebsiella pneumonia*, *Micrococcus flavus*, *Sarcina lutea*, and other bacteria are used to test the effectiveness of medications. The effectiveness of several vitamins is assessed using live bacteria, yeast, and moulds. For assessment, turbidimetric and cylinder plate microbiological tests are utilised.

2.Antifertility activity

Contraceptives and abortion pills are examples of antifertility medications. Medications used as contraceptives are also utilised as abortion drugs to end pregnancies. Male rats are used to study the antispermaticogenic (inhibition of spermatogenesis) and spermicidal (sperm motility) effects of herbal medications, whereas female rats are used to analyse the antifertility activity of herbal drugs, i.e. evaluate the pregnancy rate (antiovulation and anti-implantation).

3.Hypoglycemic activity :-

To evaluate a plant extract's hypoglycemia potential, rabbits, rats, or mice are utilised. For the purpose of measuring insulin levels, radio-immuno assays (RIA) or enzyme-linked immunosorbent assays (ELISA) are used.

4.Neuropharmacological activity :-

examining the effects of herbal medications on the central and autonomic nerve systems. Rodents are used in the testing of CNS-acting medicines including cocaine (*Erythroxylum coca*), morphine (*Papaver somniferum*), and cannabidiol (*Cannabis sativa*). Guinea pig ileum for antispasmodic action, rabbit jejunum for adrenergic activity, rat phrenic-nerve-diaphragm for muscle relaxant activity, and frog rectus for skeletal muscle activity were used to assess the effects of herbal medicines on the ANS.

6 .Analytical evaluation :-

Generally speaking, quality control is based on three key pharmacopoeia definitions: identity, appropriateness, and appropriateness. Purity: Are there any impurities, such as other plants that shouldn't be present? Content or assay: Are the active components' contents within the permitted ranges. Since the active ingredients in the majority of herbal medications are unknown, it is evident that the content is the hardest factor to evaluate. Markers, which are by definition chemically defined substances of interest for control reasons regardless of whether they have any therapeutic effect or not, can occasionally be utilised. Criteria including preparation type, sensory characteristics, physical constants, adulteration, pollutants, moisture, ash content, and solvent residues must be met in order to demonstrate identity and purity. be examined In order to establish the quality control of herbal pharmaceuticals, the proper identification of the raw herbal material, or the botanical quality, is crucial [EMEA, 1998; Sharma, 1995; WHO, 1992]. By doing macro- and microscopical exams, identity can be determined. Voucher specimens make for trustworthy reference materials. Plant disease outbreaks may alter the morphological characteristics of the plant, making it difficult to identify. Purity, which deals with elements like ash values, contaminants (such as foreign materials in the form of other herbs), and heavy metals, is intimately related to the safe use of medications. Modern purity evaluation now takes into account microbiological contaminants, aflatoxins, radioactivity, and pesticide residues thanks to the use of enhanced analytical techniques. analytical techniques like UV, photometric analysis GC), thin layer chromatography (TLC), high performance liquid chromatography (HPLC), and infrared, mass spectrometric, and nuclear magnetic resonance (IR, MS, and NMR) techniques can be used to determine the consistent content of herbal medicines.

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