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Short Communication

Design and development of Unani anti-inflammatory cream

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ABSTRACT

Inflammation is the symptom of many diseases like rheumatoid arthritis and osteoarthritis. Many side effects are associated with the Non-Steroidal Anti-inflammatory Drugs (NSAIDs) used as conventional treatment for these conditions. In Unani, there are large number of single and compound drugs for inflammatory conditions. One dosage form of Unani system of medicine is named as Zimad in which paste is formed by mixing powder in oil, water, herbal extract. Zimadat is prepared just before application and used in many disease conditions as resolving, styptic, astringent, and antiseptic. As the pre-application procedure is difficult and also complicated for patients, hence, the present study attempted to modify the form of Zimad into cream. Various batches of cream of *Zimad Mohallil* were prepared by using extracts of the formulation and by adding additives. Various physicochemical parameters of prepared cream were carried and compared with market cream. The optimized cream of *Zimad Mohallil* (F₄) was selected after preliminary tests and evaluated further. The optimized cream showed good results in physicochemical parameters equivalent to market sample. *Zimad Mohallil* was converted into convenient cream form by adding minimum additives and benefits could be achieved without any hassle and cumbersome work, which is encountered in crude or paste form. The optimized cream was equivalent to standard market cream.

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1. Introduction

There are large number of single and compound drugs in Unani system of medicine, which have been described as analgesics and anti-inflammatory. Some of them such as *Suranjan* (*Colchicum luteum*) [1], *Khulanjan* (*Alpinia galanga*) [2], *Babuna* (*Matricaria chamomilla*) [3], *Nakhuna* (*Astragalus hamosus*) [4], *Reward chini* (*Rheum emodi*) [5], *Asgandh* (*Withania somnifera*) [6], *Arand* (*Ricinus communis*) [7], *Chobchini* (*Smilax china*) [8], *Muqil* (*Commiphora mukul*) [9], *Zanjabeel* (*Zingiber officinale*) [10], *Dhatura* (*Datura stramonium*) [11] have been scientifically proven to possess anti-inflammatory action. Apart from single drugs given above, some drugs are used as combination of different ingredients (compound formulation). Compound formulations are used either externally such as *Roghan surkh*, *Zimade naana*, *Roghan babuna*, *Roghan haft*

barg, *Marham daakhilyoon* or internally such as *Habb suranjan*, *Habb muquil*, *Majoon yograj goggul*, *Majoon chobchini*, *Habb suranjaan*, *Habb hudaar*, *Habbe asgandh* [12–14]. In the present study, an attempt was made to modify the form of one compound formulation from above mentioned different formulations which is *Zimad*. *Zimad* is an important dosage form of Unani system of medicine. It is a powder preparation and always used in a paste form after mixing in any of the specified oils, water etc. at the time of use [15–17]. It is generally prepared with the drugs having *Mohallil* (resolving), *Habis* (styptic), *Qabiz* (astringent), and *Dafe Taffun* (antiseptic) properties. Different types of oils are used in the preparation of *Zimad* like *Roghane gul*, *Roghane zard*, *Roghane badam*, *Roghane kunjad* and sometimes *arqiyat* are also used or any other specified oil mentioned in text [18]. Drugs which are mostly used for the preparation of *Zimadat* and their indication is specially for *awraam baaridah* (Inflammation) such as *Babuna* (*M. chamomilla*), *Nakhuna* (*A. hamosus*), *Marjanjosh* (*Origanum vulgare*), *Soya* (*Anethum graveolens*) [19].

The primary aim of the present research work is to explore new alternatives for the treatment of inflammatory conditions which are commonly associated with many diseased conditions like

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rheumatoid arthritis and osteoarthritis. The conventional treatment for these conditions comprises of oral medication which includes the tablets of NSAIDs. However there are many side effects associated with these conventional NSAIDs therapy. In India, Unani system of medicine has been practised since ancient times and many medicinal plants are used in the form of their powders, extracts to treat many diseases and claimed to have lesser side effects than the drugs of modern system of medicine available in the market. Though the above mentioned dosage form, *Zimad* is very much helpful in treating anti-inflammatory conditions, but the pre-application procedures and application is difficult and sometimes not suitable for the patients. Therefore in the present study, an attempt was made to modify the form of *Zimad Mohallil* (Z.M.), an ancient classical preparation mentioned in Unani literature for anti-inflammatory action into a cream based semi-solid preparation to improve the patient's compliance. The composition of Z.M. is mentioned in the National Formulary of Unani Medicine [Part I]. The ingredients of the preparation are *Ikhlilul malik* (*A. hamosus* Linn.), *Babuna* (*M. chamomilla* Linn.), *Asgandh* (*W. somnifera* Dunal.), *Rewand chini* (*R. emodi* Wall), *Tukhme khatmi* (*Althea officinalis* Linn.), *Mako* (*Solanum nigrum* Linn.) and *Muqil* (*C. mukul* Hook.) (Table 1) [15]. The formulation design of Unani anti-inflammatory cream exploiting the composition of Z.M. may improve the efficacy and patient compliance of this Unani classical preparation.

2. Materials and methods

2.1. Procurement and identification of herbal drugs

The ingredients of the anti-inflammatory cream formulation were procured from the market and were identified and certified by Senior Asst. Professor, C-RMR, TransDisciplinary University (TDU) FRLHT-IAIM, Bengaluru. The specimens were preserved in the Repository of Medical Resources Herbarium and the Accession numbers are *Ikhlilul malik* – 3817, *Babuna* – 3812, *Asgandh* – 3818 and *Mako* – 3814, *Rewand chini* – 3816, *Tukhme khatmi* – 3813, *Muqil* – 3815. The additives were procured from a reputed chemical dealer of good standard.

2.2. Extraction of herbal drugs

All the crude drugs/ingredients of *Zimad Mohallil* were cleaned to remove the impurities present, and allowed to dry in shade. Thereafter all the ingredients were separately put in electrical grinder to make a coarse powder. This coarse powder was then mixed together in required proportion as in Z.M. except *Muqil* (Table 1) after that hydroalcoholic extracts of all drugs were collected through Soxhlet apparatus in the ratio of 1:5:5 (Drug:-Distilled water:Ethanol) at 50 °C till the drugs got exhausted. Extracted material was first filtered and then dried in water bath. After drying, percentage of extractive value of Z.M. was calculated. This extract was ground in mortar and pestle and stored in an air

tight glass container at room temperature for further use. *Muqil* (*C. mukul*) was taken in 1/4th proportion of all drugs and macerated with hydroalcohol 1:5:5 (*Muqil*:Distilled water:Ethanol) and after 24 h filtered dried and stored well.

2.3. Preparation of Unani anti-inflammatory cream

The formula of Z.M. used in inflammatory disease was taken from reference book *National Formulary of Unani Medicine Part 1*. Ingredients of Z.M. were *Ikhlilul malik*, *Babuna*, *Asgandh*, *Mako*, *Rewand chini*, and *Tukhme khatmi* in equal quantity and *Muqil* in 1/4th quantity. Z.M. is recommended to be applied in paste form on affected area, which is prepared by mixing the powder of ingredients as given above with water or arq-e-mako. Z.M. was selected for conversion into an anti-inflammatory cream. Anti-inflammatory cream composed of same ingredients as in Z.M. was prepared with some additives. Cream was formulated by preparing multiple batches and final batch was selected by analysing those different batches.

First heat Polyethylene glycol (PEG) 4000 and Polyethylene glycol (PEG400) on a water bath at 65 °C. Extracts were mixed with deionised water and then mixed with PEG 400. Thereafter PEG 4000 was poured gradually in this solution and stirred continuously until cool and congealed [20]. Different batches of anti-inflammatory cream were prepared by optimizing the concentration of PEG 400 and PEG 4000 as shown in Table 2.

2.4. Phytochemical analysis

The hydroalcoholic extract obtained was subjected to various phytochemical screening as per the standard procedures to reveal the presence of various active phytoconstituents like alkaloids, carbohydrates, flavonoids, glycosides, phenols, proteins, resins, saponins, steroids and tannins [21,22].

2.5. Development of anti-inflammatory cream

Different batches prepared were tested for organoleptic properties like appearance, odour, homogeneity, physical stability, pH, spreadability, extrudability and total residue. Best optimized formula was selected on the basis of analysis of different batches on the above mentioned parameters. Thereafter final batch was further evaluated. One final batch and one market cream were tested on various parameters mentioned below [23–25]. Same type of market cream was selected which is made up of herbal ingredients as in the in-house preparation. The composition of market cream is Linseed oil (3.0%w/w), Methyl salicylate (15.0%w/w), Menthol (2.0%w/w), Turpentine oil (3.0% w/w) and gel base (q.s).

2.5.1. Extrudability

Two different samples (one in house & one marketed) were filled into collapsible aluminium tubes and sealed by crimping the

Table 1
Ingredients of *Zimad Mohallil*.

S. No.	Ingredients	Scientific name	Parts used	Quantity
1.	<i>Ikhlilul malik</i>	<i>Astragalus hamosus</i> Linn.	Pods	1 kg
2.	<i>Babuna</i>	<i>Matricaria chamomilla</i> Linn.	Flowers	1 kg
3.	<i>Asgandh</i>	<i>Withania somnifera</i> Dunal.	Roots	1 kg
4.	<i>Mako</i>	<i>Solanum nigrum</i> Linn.	Fruits	1 kg
5.	<i>Rewand chini</i>	<i>Rheum emodi</i> Wall	Roots	1 kg
6.	<i>Tukhme khatmi</i>	<i>Althea officinalis</i> Linn.	Seeds	1 kg
7.	<i>Muqil</i>	<i>Commiphora mukul</i> Hook.	Resin	250 g

Table 2
Formulation composition (%w/w) of different batches of anti-inflammatory cream.

S. No.	Ingredients	F ₁	F ₂	F ₃	F ₄
1.	Extract	6.25	6.25	6.25	6.25
2.	Polyethylene glycol 400	56.14	44	40	48.72
3.	Polyethylene glycol 4000	37.44	38	43.6	30.72
4.	De-ionised water	0	14	10	14
5.	Methyl paraben	0.1	0.1	0.1	0.1
6.	Propyl paraben	0.05	0.05	0.05	0.05
7.	Perfumes	q.s	q.s	q.s	q.s

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