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THERAPEUTIC EVALUATION OF SURMA (KOHL) FORMULATIONS +

ZAHEER BABAR HASHMI, ZAFAR ALAM MAHMOOD* AND S. M. S. ZOHA

Mohammad Hashim, Tajir Surma, Karachi, Pakistan

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Six surma (Kohl) formulations or their combinations along with two collyria and an eye embrocation were evaluated for their therapeutic efficacy in four eye ailments, namely conjunctivitis, trachoma, pterygium, and weak eye-sight. In the conjunctivitis group, ten patients were found to be associated with infective type, while five patients were found conjunctivitis of allergic origin. The predominent organism identified in the first two diseases were *Staphylococcus aureus* and *Haemophilus aegyptius* respectively. Patients of both group were treated with two surma formulations, Safaid Kohlul Jawahar Awwal (SKJA) and Safaid Kohlul Jawahar Chaharum (SKJC). The conjunctivitis group was additionally used Arq-e-Gulab(AEG) as collyria and Zamad as an eye embrocation, where as Gulab lotion (GL) as collyria was used only in trachoma group. Success rate was 100% in conjunctivitis gruop and 98% in trachoma group respectively. Patients in pterygium group were treated with three surma formulations: SKJA or SKJC and AS (Anjal Surkh), success rate was 98% while surma formulations SKJ (Siah Kohlul Jawahar), ZEB (Zoaf-e- Basar), KA (Kohlul Ajeeb) and SKJA or their combinations were found highly effective among patients or weak eye-sight.

Key words: Surma, Kohl, Conjunctivitis, Trachoma, Pterygium, Weak eye-sight.

Introduction

Protection of eye against diseases has been reported to be one of the oldest science. Ancient civilization were using many types of preparations to protect their eyes against diseases. However, with the advancement of science and technology, man has modified these ophthalmic preparations to get better result, and the following preparations should also be included among those. Surma (Kohl - ultra fine powder), collyria (eye drops), mucilages (eye ointments), embrocations, and dressings.

Surma (Kohl) has been associated with the human civilization for the treatment and prevention of eye disease, and also for strengthening that and keeping the eyes healthier [1]. The main constituent (base) of surma has been galena (lead sulphide). However, it has been referred as antimony by few ancient authors [2,6] because of the confusions of vernacular names of lead and antimony, and its general appearance. For example, in Egypt galena was familiar under the name of Mestem or Stim while this word was identical to Greek word Stimmi or Stibi and the latin word Stibium, meaning antimony. However, this controversy was resolved scientifically [2-7]. Surma is practically a galena based eye formulation in which certain herbs, precious stones and other useful ingredients are also added.

In the Unani and Ayurvedic system of medicine, surma has been recommended for use against various diseases [8] and has always occupied a premier position in the field of ophthalmology. However, it was felt that proper scientific data on various eye diseases should be generated and with this view, the present study was organised to evaluate some of the surma formulations against few diseases. Further work on these surma formulations and some others against larger number of patients is under progress. All surma formulations used in this study were manufactured by M/s. Mohammad Hashim Tajir Surma, Karachi, Pakistan.

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* Department of Pharmaceutics, University of Karachi, Karachi, Pakistan.

Materials and Methods

A. isolation and identification of bacterial flora from conjunctival exudate:

Conjunctival exudate samples. For isolation of bacteria, conjunctival exudate (discharge) of the infected patients was collected with the help of sterile swab and immediately transferred aseptically into sterile saline solution.

Isolation media and technique. The bacterial species were isolated by spreading 1.0 ml of the exudate specimen as well as a 1:100 diluted specimen on Bacto Tryptic Soy Agar (Difco) and Bacto Blood Agar (Difco). After incubation at 30° for 24 - 72 hrs colonies which appeared were isolated and purified by repeated cultivation on to the same agar medium.

Identification of organisms. The bacterial species isolated from the conjunctival exudate were tentatively identified by taxonomic camparison (characteristic morphological and bio-chemical properties) with description given in [9 - 13].

B. Examination of stained conjunctival exudate and scraping.

The materials and method used for the preparation of film and staining (such as Gram's staining, Giemsa's staining, Acid fast staining and Negative staining) were same as described by Pelezar [10] and Mackie [13].

C. Ocular examination and symptoms of ocular disease:

Ocular examination. Ocular examination was carried out for patients of all disease groups. This include the examination of pupils and ptosis.

Symptoms of ocular disease. This include the observa-

tion of the following: redness, ocular pain, foreign body sensation, photophobia, itching, scratching and burning, watering, eyestrain and headache, conjunctival discharge and conjunctival scraping.

D. Treatment pattern:

(i). Conjunctivitis group. Patients No: 6, 9, 10 and 12 (SKJC - Thrice daily for 7 days). Patients No: 2,7,8,11 and 14 (SKJA - Thrice daily for 7 days). Patients No: 1,3,4,5,13 and 15 (SKJA - Four times a day for 3 days, then thrice daily for 6 days). Application of Zamad twice daily for 6 days.

(ii). Trachoma group. Patients No: 1,2,5,7,8,9,10 and 12 (SKJA- Thrice daily for 3 weeks) Patients No: 3,6,11, 13, 14 and 15 (SKJC - Four times a day for 2 weeks, then SKJA - thrice daily for 3 weeks). GL - Twice daily for 1 week. Application of Zamad twice daily for 1 week.

(iii). Pterygium group. Patients No: 1,2,3,4,5,10,12 and 15 (SKJA - Trhice daily for 1 week, then SKJA - Twice daily for 1 week), then AS - Twice daily for 6-8 months. Patient No: 6,7,8,9,11,13 and 14 (SKJA - Morning) and, AS - Bed time for 6-8 months.

(iv). Week eye-sight group. Patient No: 1,5,6,12 and 15 (ZEB - Twice daily for 6 months). GL - Once daily for 1 month, then, KA, SKHA and ZEB (in equal proportion) twice daily for 8 months. Patients No:2,3,4,7,10 and 11 (SKJA - Thrice daily for 2 months), then, SKJA and ZEB (in 0.75 : 1.5) twice daily as mainteinance dose. Patients No: 8,9,13 and 14 (SKJA - Twice daily for 3 months), then SKJ and SKJA (in 1.5 : 0.75) Twice daily for 6 months.

Results and Discussion

Clinical data presented include the details of the symptoms of the disease, the possible causative agents, and the surma formulations used for the treatment, is based on the 15 patient of each disease group.

Thirty eight bacterial species were isolated and identified on the basis of morphological and bio-chemical properties from thirty conjunctival exudate samples collected at the clinic of M/s. Mohammad Hashim Tajir Surma, Karachi, Pakistan. The taxonomic comparisons were made with the descriptions given in the official compendia [9-13].

In the conjunctivitis group, ten patients were found to be associated with infective type, while the remaining five patients were found conjunctivitis of allergic origin. The predominent organism identified in this group was *Sataphylococcus aureus*, however, in three cases *Moraxella lacunata* and in five cases *Bacillus subtilis* were also detected. In the allergic group no pathogenic bacterial species were detected. In the trachoma group, the predominent organism was found to be *Haemophilus aegyptius*, however, in six cases *Chlamydia trachomatis* was also identified from conjunctival scrapings. Identification of *Chlamydia trachomatis* was based on Giemsa's staining and complement fixation tests [10, 13]. Success rate was 100% (in conjunctivitis group), 98% (in trachoma group) and 98% (in pterygium group). Symptoms of the ocular disease and ocular examination of conjunctivitis, trachoma, pterygium and weak eye-sight groups are given in Tables 1-4 respectively.

The inflammation of conjunctiva menifests itself in many grades and many types, however, in this study it was classified as infective and allergic types, while trachoma was observed purely due to microbial invasion. Both diseases were observed as highly contagious and found to spread by the transference of conjunctival secretion through fingers or towels and, above all by flies where the surroundings were unhygeinic or unhealthy. A liability increased by the presence of such discharge.

Treatment of both groups (conjunctivitis and trachoma) was done by surma Safaid Kohlul Jawahar Chaharum and Awwal (SKJC and SKJA). Surma SKJC is usually recommended in severe cases, while SKJA is usually applied in mild cases. These two surma formulations were found highly effective in controlling the microbial proliferation, watering, irritation, burning and conjunctival discharge.

Apart from eye tonic and eye protective properties, the galena based surma possess three most important therapeutic properties, i.e., astringent, adsorptive, and anti-infective properties. The astringent action is observed at the site of its application. Since it has an affinity for sulphur, therefore, it combines with sulph-hydryl group of the membrane and produces a local action due to the precipitation of proteins in very low concentration. The adsorptive property which is a

Table 1. Symptoms Observed in Patients of Conjunctivitis Gruop.

Symptoms	Absent	Mild	Moderate	Severe	Very severe
1. Redness	–	–	7	7	1
2. Pain	–	7	6	1	1
3. Sensation	7	8	–	–	–
4. Photophobia	–	9	4	2	–
5. Itching	–	3	8	2	2
6. Watering	5	4	6	–	–
7. Scratching & burning	5	4	6	–	–
8. Eyestrain & headach	10	5	–	–	–
9. Discharge	–	8	3	2	2
10. Vision	N	N	N	N	N
11. Cornea	CL	CL	CL	CL	CL
12. Pupil size	N	N	N	N	N

N = Normal, CL = clear, – = none.

TABLE 2. SYMPTOMS OBSERVED IN PATIENTS OF TRACHOMA GROUP.

Symptoms	Absent	Mild	Moderate	Severe	Very severe
1. Redness	–	–	8	6	1
2. Pain	–	15	–	–	–
3. Sensation	–	10	5	–	–
4. Photophobia	–	8	5	2	–
5. Itching	–	–	7	5	3
6. Watering	–	10	3	1	1
7. Scratching & burning	–	7	8	–	–
8. Eyestrain & headach	–	7	8	–	–
9. Discharge	–	15	–	–	–
10. Vision	N	N	N	N	N
11. Cornea	CL	CL	CL	CL	CL
12. Pupil size	N	N	N	N	N

N = Normal, CL = clear, – = none.

TABLE 3. SYMPTOMS OBSERVED IN PATIENTS OF PTERYGIUM GROUP.

Symptoms	Absent	Mild	Moderate	Severe	Very severe
1. Unilateral	–	12	2	1	–
2. Bilateral	–	–	–	–	–
3. Genetic predisposition	–	–	–	–	–
4. Vision	N	N	N	N	N
5. Primary lision	3	10	2	2	1
6. Recurance	12	–	2	1	–
7. Redness	8	3	1	2	1
8. Watering	11	1	1	2	–

N = Normal, – = none.

TABLE 4. SYMPTOMS OBSERVED IN PATIENTS OF WEAK EYESIGHT GROUP.

Symptoms	Absent	Mild	Moderate	Severe	Very severe
1. Redness	12	2	1	–	–
2. Pain	13	1	1	–	–
3. Itching	7	4	2	1	1
4. Watering	12	2	1	–	–
5. Eyestrain & headache	–	4	7	2	2
6. Pupil	N	N	N	N	N
7. Distance vision (DV)	L –	4	2	7	2
	R –	3	4	6	2
8. Near vision (NV)	L 10	–	–	2	3
	R 10	–	–	4	1

L = Left eye, R = Right eye; DV = Distance vision, Mild (0.25 - 0.5), Moderate (1.0 - 1.75), Severe (2.0 - 2.5), Very severe (3.0 - 3.5); NV= Near vision Mild (0.25 - 0.5), Moderate (1.0 - 1.75), Severe (2.0 - 2.5), Very severe (3.0 - 3.5), N = normal, – none.

surface phenomenon helps in cleaning the eyes from dust as well other foreign matters invading the eyes, while the anti-infective properties are due to the specific inhibitory action of galena on vital enzyme system of the cell. This phenomenon is known as the Oligodynamic action [14-16].

The two collyria (Arq-e-Gulab and Gulab lotion) used in this study were found highly effective in relieving irritation and reddening of the eyes, and produce a cooling effect. Zamad was applied as an eye embrocation to the patients having highly degree of pain and inflammation. It has powerful analgesic and anti-inflammatory action.

Pterygium is a fleshy, triangular encrohment of the conjunctiva mostly on to the nasal side of the cornea and is usually associated with constant exposure to wind, sun, sand and dust etc. Pterygium may be either unilaterl or bilateral. There may be a genetic predisposition, but no hereditary pattern has been experienced. Treatment of this was primarily based on the elimination of redness, burning, and watering first with the help of surma SKJA or SKJC and then Anjan Surkh was applied in continuation with SKJA for longer period. It was proved to be an excellent formulation for the removal of pterygium.

Patients of weak eye-sight were treated with four different surma formulations, SKJ, SKA, ZEB, KA or their combinations and were found highly effective.

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