

*Research Article***The use of Topical Brimonidine in Dermatology****Moetaz B. El-Domyati, Walid M. Abd El-Naeim and Samah S. Abdel hameed**

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Abstract

Introduction: Brimonidine tartrate is a lipid soluble alpha 2 adrenergic highly selective receptor agonist with potent vasoconstrictor activity that had been approved for management of open angle glaucoma, it is also currently indicated for the topical treatment of persistent (nontransient) facial erythema. **Aim of the Work:** The aim of the present study is to evaluate the use and effectiveness of topical brimonidine (alpha 2 adrenergic receptor agonist) clinically and histologically, for the management of facial erythema. **Patients and Methods:** The study was conducted on 20 patients presenting with red face. Cases were collected from those attending the dermatology outpatient clinic at Minia University Hospital in the period of July 2014 to April 2017. **Results:** The present study was conducted on 20 patients, attending the Dermatology outpatient clinic, Minia University Hospital for treating redness of face. The age of these patients at the time of the examination ranged from 12 to 55 years. Fourteen (60%) of them were female and six (40%) were males. **Summary and Conclusions:** The considerable desire of patients to have healthy skin and to get rid of any dermatologic problem is matched by the number of modalities offered to patients, both medically and non-medically, to achieve that goal. Many of these modalities have been well studied, whereas others have not.

Keywords: Topical, Brimonidine**Introduction**

Brimonidine tartrate is a lipid soluble alpha 2 adrenergic highly selective receptor agonist with potent vasoconstrictor activity that had been approved for management of open angle glaucoma, it is also currently indicated for the topical treatment of persistent (nontransient) facial erythema⁽¹⁾.

Brimonidine tartrate 0.5% induces its onset of erythema reduction within 30 minutes with the peak effect lasting over 4 to 6 hours, ultimately providing duration of peak erythema reduction lasting from 2 through 8 hours after a single application⁽²⁾.

Flushing is a phenomenon of transient vasodilatation which is part of a coordinated physiologic thermoregulatory response to hyperthermia, resulting in increased cutaneous blood flow. The erythema is most prominent in the blush area which includes face, ears, neck, and upper chest⁽³⁾. Red face (Facial erythema) is a condition which is characterized by redness, blushing or flushing of the face. It can be temporary

for few moments, or it can be present for days, weeks or months at a time. It can be predisposed by fever, menopause, as well as dietary, environmental or emotional factors, such as anger, heat, wind, coughing or eating spicy food⁽⁴⁾.

Causes of facial redness include skin infections, rosacea, acne, eczema, inflammatory conditions as sunburn, vasculitis, and allergies to foods, insect bites, and face creams. In other cases, skin conditions causing a red face can be inherited or develop due to genetic factors or aging⁽⁵⁾.

Aim of the Work

The aim of the present study is to evaluate the use and effectiveness of topical brimonidine (alpha 2 adrenergic receptor agonist) clinically and histologically, for the management of facial erythema.

Patients and Methods

The study was conducted on 20 patients presenting with red face. Cases were collected

from those attending the dermatology outpatient clinic at Minia University Hospital in the period of July 2014 to April 2017.

Patients were classified according to cause of redness into two groups:

- A) Rosacea group (10 cases).
- B) Miscellaneous group (10 cases):
 1. Systemic lupus erythematosus (3 cases).
 2. Sun burn (2 cases).
 3. Flushing (2 cases).
 4. Contact dermatitis (2 cases).
 5. Port wine stain (1 case).

All patients were subjected to the following

- An informed consent had been obtained from all volunteers for treatment procedure, taking skin biopsies and photographing. The procedure, potential complications and realistic expectations were discussed with the patients.

- Full history taking including; personal history (age, sex and occupation), present history (onset, course and duration of the disease) and past history (previous medications).

- General, clinical and dermatological examinations.

- Photographing of the face before the start of treatment and at the end of treatment.

- The study was approved by the Committee for Postgraduate Studies and Research of Minia University.

- Advising patients that brimonidine drops is for external use only and that contact with the eyes and lips should be avoided; and also not applied to irritated skin or open wounds.

- Application of Brimonidine topical eye drops 0.2%, on areas of red facial skin according to the planned protocol, it was applied twice daily for three months. It was applied smoothly and evenly as a thin layer across the entire face, avoiding contact with the eyes and lips, then wash hands after application.

- Apply two drops to each of the 5 areas of the face (central forehead, chin, nose, and each cheek) twice daily. It is for external use only, do not administer orally, or topically to the eye and must wash hands immediately after applying brimonidine drops.

- Importance of advising patients of the possibility of erythema or flushing and to report adverse reactions to the clinician and keep brimonidine drops out of the reach of children.

- All cases had been biopsied from affected side of the face using punch biopsy before the treatment and after three months of treatment. Evaluation of the degree of improvement by the volunteers, two blinded dermatologists, and two independent observers.

Results

The present study was conducted on 20 patients, attending the Dermatology outpatient clinic, Minia University Hospital for treating redness of face. The age of these patients at the time of the examination ranged from 12 to 55 years. Fourteen (60%) of them were female and six (40%) were males (**Fig.1**).

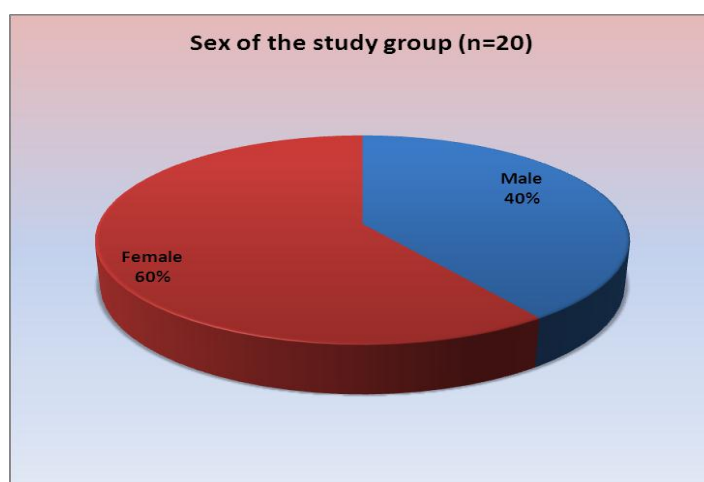


Fig. (1): Sex distribution of the studied red face patients

The age of all patients at the time of examination ranged from 12 to 55 years with a mean \pm SD of 28.4 ± 13.1 years (Fig. 1; Table 4), with group A ranging from 17

to 55 years with a Mean \pm SD of 32 ± 12.9 years, while group B ranging from 12 to 42 years with a Mean \pm SD of 24.8 ± 12.9 (Table 1).

Table (1): Clinical data of studied red face patients.

Age	Total (n=20)	Group A (Rosacea) (n= 10)	Group B (Miscellaneous) (n= 10)	P - value
Range	12 – 55	17 – 55	12 - 42	0.186
Mean \pm SD	28.4 ± 13.1	32 ± 12.9	24.8 ± 12.9	
Median	28.5	33	21	

Discussion

Aside from being a disease, facial erythema is also considered as one of the main factors affecting life quality of patients; causing embarrassment, anxiety and low self-esteem. Interest has been grown for finding effective treatment modalities that can improve facial redness⁽⁶⁾.

Facial erythema can be defined as transient vasodilatation resulting in increased cutaneous blood flow. The erythema is most prominent in the blush area which includes face, ears, neck, and upper chest⁽⁷⁾.

Acute or chronic facial erythema may be due to skin infections, rosacea, acne, eczema, inflammatory conditions (sunburn, vasculitis, and food allergy), insect bites and face creams. Facial erythema (transient and permanent) is considered as a common denominator that is frequently observed in all subtypes of rosacea and is estimated to affect more than 40 million people worldwide⁽⁸⁾.

Several medications exist to treat inflammatory skin conditions including redness, but the effective treatments targeting the erythema are few. The current treatment strategies that have received FDA approval for the treatment of rosacea are topical metronidazole, azelaic acid, sodium sulfacetamide, doxycycline and ivermectin⁽⁹⁾.

The only approved and reported topical treatment for facial erythema is brimonidine gel 0.33% (Mirvaso®; Galderma SA,

Lausanne, Switzerland) which has received FDA approval in August 2013 for treatment of rosacea (1 g of gel contains 3.3 mg of brimonidine, equivalent to 5 mg of brimonidine tartrate)⁽¹⁰⁾.

Brimonidine tartrate (BT) is a highly selective α_2 -adrenergic receptor agonist; it is 1000-fold more selective for the α_2 -adrenergic receptor than the α_1 -adrenergic receptor. This medication was previously used as a topical treatment for open-angle glaucoma with a well-documented good safety profile⁽¹¹⁾. Recently, it was found to be effective in controlling the diffuse facial erythema, especially in rosacea, when applied topically by acting through its vasoconstrictive activity, leading to a constriction of the abnormal dilation of facial blood vessels in patients presenting with erythema⁽¹²⁾.

Topical brimonidine tartrate and calcineurin inhibitors are at the forefront of topical therapies, alone or in combination with traditional therapies such as topical metronidazole or azelaic acid and oral tetracyclines or isotretinoin. Vascular laser and intense pulsed light therapies are beneficial for the erythema and telangiectasia, as well as the symptoms (itching, burning, pain, stinging and swelling) of rosacea. Injectable botulinum toxin, topical ivermectin, and microsecond long-pulsed neodymium-yttrium aluminum garnet laser are emerging therapies that may prove to be extremely beneficial in the future⁽¹³⁾.

Summary and Conclusions

The considerable desire of patients to have healthy skin and to get rid of any dermatologic problem is matched by the number of modalities offered to patients, both medically and non-medically, to achieve that goal. Many of these modalities have been well studied, whereas others have not.

Facial redness is a common acute or chronic inflammatory condition of the facial skin with a spectrum of clinical features that can wax and wane over time. This erythema is characterized by redness, blushing or flushing in the blush area which includes face, ears, neck, and upper chest. The reason of this predilection is that the visible superficial cutaneous vasculature in these regions is relatively more in volume than in other regions in the body, as well as qualitative differences in skin vascular response and vascular regulation compared to other body areas.

Causes of facial erythema include; skin infections, rosacea, acne, and eczema, inflammatory conditions as sunburn, vasculitis, and allergies to foods, insect bites, and face creams. In other cases, skin conditions causing a red face can be inherited or develop due to genetic factors or aging.

Persistent manifestation of facial erythema is a very common and resistant to treatment in many cases such as rosacea, systemic lupus erythematosus, contact dermatitis and port wine stain.

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