Effect of Isotretinoin on Malondialdehyde (MDA) Level in Iraqi Patient Afflicted with Acne Vulgaris In Baghdad Governorate

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Abstract

Background: The predominantly typical dermatological ailment is Acne Vulgaris. Even though isotretinoin (13.cis. retinoic acid) trade name Accutane is the drug commonly used to treat Acne Vulgaris and is a well-tolerated drug, like most treatments, it has a wide range of side effects. Objective: The current research objective is in the exploration of the impact of this drug on MDA malondialdehyde level that is the resultant outcome of lipid peroxidation and the level of cholesterol and Triglycerides. Patients and Methods: The patients are those who attended the Dermatology Consultation Clinic in the Medical City Hospital where the investigation is being conducted on the before and after treatment, with Isotretinoin being taken for a duration of two months. We measured Malondialdehyde (MDA) level and cholesterol triglyceride levels. Results: There is an increase in Malondialdehyde (MDA) level after the treatment with Isotretinoin p value < 0.001, there is also an increase in cholesterol and triglyceride level after the treatment with a p value <0.001. Conclusion: The conclusion of the study revealed that an addition of vitamin E is the current treatment for Acne Vulgaris that reduced the oxidative stress in the pilosebaceous unit a lot, and thus increase the Reactive Oxygen Species (ROS) associated with Acne Vulgaris, where this treatment is not given unless truly needed.

Keywords: Isotretinoin, Lipid Level, Malondialdehyde MDA, Acne Vulgaris, oxidative stress


1. Introduction

Isotretinoin, also termed as 13-cis- retinoic acid with the trade branding of Accutane, is a medication mainly utilized for the treatment of serious acne, rarely is it used to prevent certain skin cancer (squamous – cell Carcinoma), and in the treatment of other cancers. It is used to treat Harlequin – type of ichthyosis, a usually morbid Skin disease, and Lamellar ichthyosis. It is a retinoid, meaning it is related to vitamin A, and is discovered in minute amount inherently in the physical self. The isomer retinoic acid is also an acne drug, in cases of the Acne Vulgaris becoming serious and turned nodulo-cystic, and is not responding to a combination of antibiotics or treatments that apply the medicine directly onto the acne, it requires the use of isotretinoin consumed orally [1].

In the past, it was kept for severe Acne Vulgaris, however it is suggested as an acceptable use policy for mild acne instances [2]. This drug is the only efficient medicine which operates by aiming at the 4 pathogenic elements in totality in addition to have gained the approval of the Food and Drug Administration (FDA), for the treatment of serious acne from the year 1982. The drug is also used in treatment for acne with extreme case of blemishes, acne that have serious psychological and sociological disfigurement and extreme acne on the face and on the body [3].

The dosage per day is 0.5 – 0.1 mg/kg of the body weight, to be taken daily for four to eight months [4] with asymptomatic and degree of healing through treatment prescribed at the clinic is eighty-five percent at the maximum [5] It should consumed following a meal because of the increase in bioavailability and should be added till a cumulative dose of one hundred and twenty up to one hundred and fifty mg / kg has been achieved [6]. However, recent clinical trial advised that a lesser dose to address the mortal adverse reaction related with the conventional large dosage.

The therapy might be started with an efficient large dosage for the initial 56 days ensued by a smaller dosage for the preservation of the level of drug in the blood. [7]. In the past, in clinical practice the utilization of “oral isotretinoin” is advised to be used only in severe acne, while nodular acne does not respond to several kinds of
antibiotic. and topical therapy [8] after almost 3 decades of clinical experience with oral isotretinoin, the released papers: that were under publications, in addition to the standpoint of many physicians endorsed systemic isotretinoin be deemed. as 1st choice remedy of severe and mild, papulopustular acne. Recent directions for the remedy of acne instructs the immediate use of isotretno in to be consumed orally, instead of being taken at a subsequent time [9].

2. Material and Method:

1. Add one mililitre of serum to two mililitre of (TCA – TBA –HCL reagents), solution and mix thoroughly, heat for fifteen minutes in boiling water bath and leave to cool.
2. The precipitate is isolated, after centrifugation, at 3000rpm for ten minutes.
3. The absorbance is read at 535 min against reagent blank.
4. Calculation

\[ MDA \left( \frac{\text{Mole}}{L} \right) = a t - \frac{At - Ab}{\varepsilon MDA(1.56 \times 10^5)b} \times 10^6 \]

3. Result and Discussion:

Table (1): Result on Patient with acne and use Isotretinoin

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Patients group before treatment [n=16] (Mean±SD)</th>
<th>Patients group after treatment [n=16] (Mean±SD)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDA(µg/l)</td>
<td>0.88 ± 1.34</td>
<td>0.69 ± 0.85</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Cholesterol (mg/ml)</td>
<td>138.87 ± 24.17</td>
<td>158.17 ± 30.48</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>TG(mg/ml)</td>
<td>74.43 ± 21.27</td>
<td>107.28 ± 39.79</td>
<td>&lt; 0.001*</td>
</tr>
</tbody>
</table>

Acne is caused by excess supply of sebum, follicular hyper keratinization, and elevated level of inflammatory mediators [10] Moreover. oxidative stress inside the pilosebacous unit is an essential factor. in the pathogenesis of acne [11]. Our result showed an increased level of malonaldehyde (MDA) which comes from lipid peroxides. Cholestrol, triglyceride also increased in patients treated with isotretinoin as shown in table (1)

This drug has become a subject for researcher pertaining oxidative stress whether it decreases or increases [12]. Isotretinoin is a potent teratogen and one of the mechanism of its teratogenesis is the production of toxic reactive oxidative stress [13]. Georgala et al. discovered that prior to the therapy using Isotretinion, the there were low levels for both the Isotretinion and total antioxidant capacity (TAC) in plasma and 8-hydroxy 2 desoxyguanosine (8-oHdG), an indicator for oxidative detrimental effect,.in the acne patient. Thus, Georgala et al. suggested that this drug induce DNA oxidative damage [14].

The use of antioxidant like vitamin E which is Lipped Solution to neutralize the oxidant effect of free radicals, thus preventing cellular damage [15], and precautions should be considered strongly during the treatment with oral isotretinoin.

- Affects abstinence of up to 1 month after last pill taken.
- Liver enzyme of lipid level done before and during treatment as Figure 1, 2 and 3 Retinoids inclusive of 13- Cis retinoic acid have been acknowledged in preventing PLA2 movements. and halt arachidonic acid launch in human joint fluid. (8)

The data substantiated the conjectures which claimed anti-inflammatory action of 13-Cis retinoic acid might be caused by the restriction of PLA2 expression that was modified at seven days or 56 days, constitute retinoic acid receptor reaction components alongside their promoters (8) It alludes to the probability of direct gene regulation through the typical nuclear retinoid receptor pathway. (11) Even though the 13-Cis retinoic acid itself will not trigger the RAR or RXR, it is mainly isomerised to ATRA, that are able in a direct way to trigger retinoic acid receptors (11).
4. Recommendation and Conclusion:

- It is obligatory for all patient males and females to sign and approve an information sheet, in which instance the adverse reactions and hazards of the medicine are clarified.
- Female patients must not be pregnant and the suitable contraception should be initiated immediately for both male and female patients.
Liver enzyme (complete cholesterol fasting) and triglyceride have to be within the typical range.

Daily oral supplement of vitamin E to reduce the oxidant stress in Pilosebaceous unit, and hence decreases (Reactive Oxygen Species) ROS associated with acne vulgaris.

This drug should not be prescribed and given unless truly needed.

References


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