

## Clinical and biochemical evaluation of efficacy of isotretinoin in nodulocystic acne

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### Abstract

Acne vulgaris is common dermatosis, which usually starts in adolescence and resolves by mid 20s. However in 7.17% of the individuals acne persists beyond 25 years.

**Aim:** To assess the clinical and biochemical evaluation of the efficacy of isotretinoin in nodulocystic acne.

### Objectives

1. To evaluate the efficacy of isotretinoin<sup>(1)</sup> and to monitor the clinical improvement.
2. To study effectiveness of isotretinoin in reducing seborrhea, nodule count and the devastating cosmetic effects caused by nodulocystic acne.
3. To monitor the side effects during and after treatment

**Materials and Methods:** The 45 cases for the study were selected from the patients attending department of DVL at SIMS during the period JAN 2018 to JAN 2019.

#### ▪ Inclusion Criteria

1. patients who had received earlier treatment for long periods of time in the form of systemic antibiotics, topical antibiotics, benzoyl peroxide, topical retinoids and failed to respond. 2. 15-35yrs of age of either sex.

#### ▪ Exclusion Criteria

1. Raised cholesterol levels, signs of depression, photosensitivity and those hyper sensitive to parabens were excluded from the study.
2. Females of child bearing age who were not practicing contraception, pregnant women and lactating women were excluded from the study.

### Methods

▪ Before starting Treatment, a UPT was done to exclude pregnancy. All patients were evaluated for baseline CBP, blood sugar, LFT (AST, ALT, alkaline phosphatase, serum bilirubin), RFT (blood urea, sr. creatinine), sr. lipid profile (sr. triglycerides, total cholesterol, LDL, HDL). Ultrasound abdomen and pelvis was done in women to rule out PCOD. Started on 0.5mg/kg per day of isotretinoin in single daily dose after meals. Evaluated every month for a period of 15-20 weeks. Follow up every month for 3 to 4 months. At the end of every month CBP, LFT, RFT, lipid profile were done.

**Results:** Clinical improvement - 43 out of 45 patients 22.22% (10 patients out of the total 45)- flare up of acne, Dryness and fissuring of lips - 88%, xeroderma - 2%, 2% - epistaxis, myalgias - 4%, desquamation of the palms but not soles was observed - 2% patients, 2% - headache. All routine investigations, LFT, lipid profile were repeated after 1 month and after completion of treatment. Transient elevation in serum triglycerides and total cholesterol was seen in some but not significant enough to require stoppage of treatment or anti hyperlipidemic treatment. Follow up was done for a period of 3 months after completion of treatment.

**Keywords:** isotretinoin, efficacy, nodulocystic acne

### 1. Introduction

Acne vulgaris is common dermatosis, which starts in adolescence and usually resolves by mid 20s. However in 7.17% of the individuals acne persists beyond 25 years, with physiological acne in females having prevalence of 24%.

1. It is a disease of the pilosebaceous follicular unit.
2. Endocrine mechanisms control the components of sebocyte function-namely lipid synthesis, proliferation and differentiation.
3. Androgens upregulate the sebaceous glandular function by binding to the nuclear androgen receptors (ARs). Highest density of these androgen receptors have been demonstrated in sebaceous glands.

### 2. Aims and Objectives

#### ▪ Aim

The present study attempts to assess the clinical and biochemical evaluation of the efficacy of isotretinoin in nodulocystic acne.

#### ▪ Objectives

1. To evaluate the efficacy of isotretinoin <sup>[1]</sup> in the selected cases and to monitor the clinical improvement.
2. To study how effective isotretinoin is in reducing seborrhea, nodule count and the devastating cosmetic effects caused by nodulocystic acne.
3. To monitor the common side effects during and after treatment

**Materials and Methods**

▪ **Materials**

The 45 cases for the study were selected from the patients attending dermatology at Shadan Institute of Medical Sciences, During The Period January 2018 To January 2019.

After taking a careful history and clinical examination those patients who were diagnosed as having nodulocystic acne and those with a minimum of 2 nodules were included in the study.

▪ **Inclusion Criteria**

1. All patients who had received earlier treatment for long periods of time in the form of systemic antibiotics topical antibiotics,benzoyl peroxide,topical retinoids and failed to respond were included in the study.
2. Patients between 15-35yrs of age of either sex were included in the study.

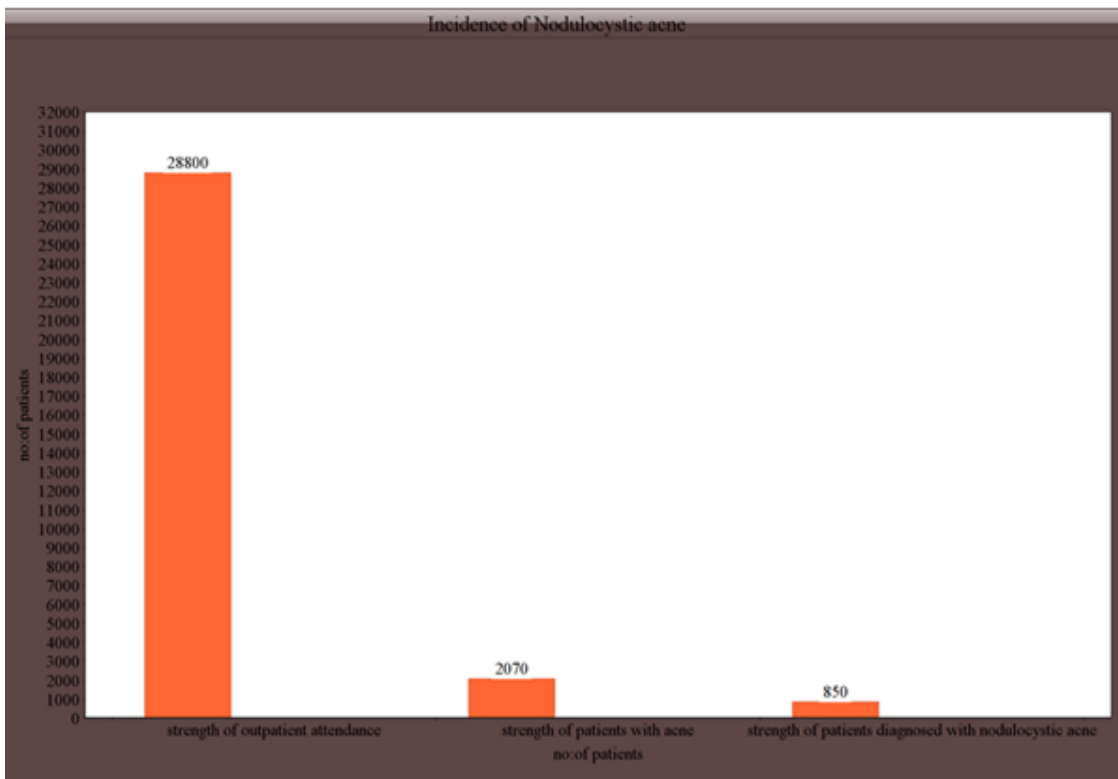
▪ **Exclusion criteria**

1. Those with raised cholesterol, signs of depression, photosensitivity and those hyper sensitive to parabens were excluded from the study.
2. Females of child bearing age who were not practicing contraception, pregnant women and lactating women were excluded from the study.

▪ **Methods**

- Before starting treatment with isotretinoin a urine pregnancy test was done to exclude pregnancy.
- All patients were evaluated for baseline complete blood picture,blood sugar,liver function tests (AST, ALT,

- alkaline phosphatase,serum bilirubin),renal function tests(blood urea,serum creatinine),serum lipid profile(serum triglycerides,total cholesterol,LDL,HDL)
- Ultrasound abdomen and pelvis was done in women to rule out any underlying PCOD.
- Total number of patients -45
- Number of male patients-41
- Number of female patients-4
- All patients were started on 0.5mg/kg per day of isotretinoin in single daily dose after meals.
- Patients were evaluated every month for a period of 15-20 weeks.
- Follow up was done every month for 3 to 4months.assessment of response, improvement and adverse effects was done on every visit.
- Those who did not respond to treatment between 6-8 weeks were stopped treatment.
- At the end of every month CBP, LFT, RFT, lipid profile [10] was done.
- Patients who developed relapse within the 3 months of follow up were not started on a second course as it was not included in the study [9, 10]
- During the study period patients were not allowed to continue treatment with tetracyclines and vitamin A supplements, azoles, macrolides.
- They were instructed to take isotretinoin after a fatty meal with a glass of water, avoidance of exposure, to use sunscreens, to avoid night driving, using contact lenses and any other procedures [7].
- They were asked to come for review every 10 days or to report in case of any adverse side effects.



**Fig 1:** Incidence of Nodulocystic Acne

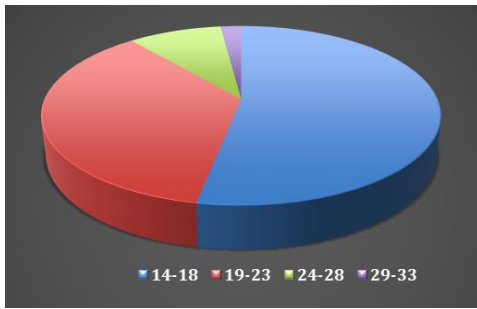
**Incidence of Nodulocystic Acne**

Total no.of out patients in dermatology op during the period January 2018 to January 2019-28,800

- Total no.of patients with acne vulgaris -2070 (7.18% of

- total out patients)
- Total no.of patients with nodulocystic acne -850 (41.06% of those with acne vulgaris)

**Age Distribution**

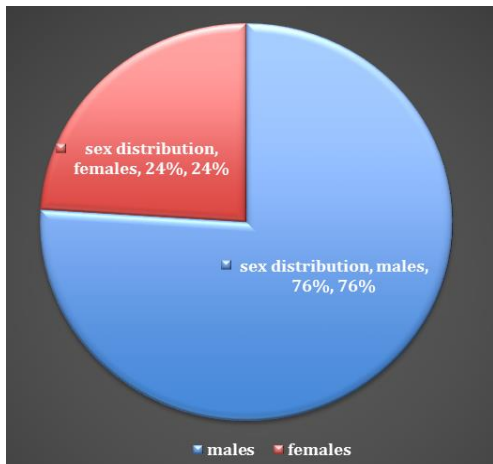


**Fig 2: Age Distribution**

**Table 1: Age Distribution**

Patient age	No.of patients	%of total patients
14-18 years	24	53%
19-23 years	16	36%
24-28 years	04	09%
29-33 years	01	02%
Total	45	100%

**Sex Distribution**



**Fig 3: Sex Distribution**

**Table 2: Sex Distribution**

	No:of patients	Percentage Of Total Patients
Total patients	45	
Male patients	41	76%
Female patients	04	24%

**Table 3**

Minimum age	14
Maximum age	32
Mean age	19.6

**Incidence of family history in patients with nodulocystic acne**

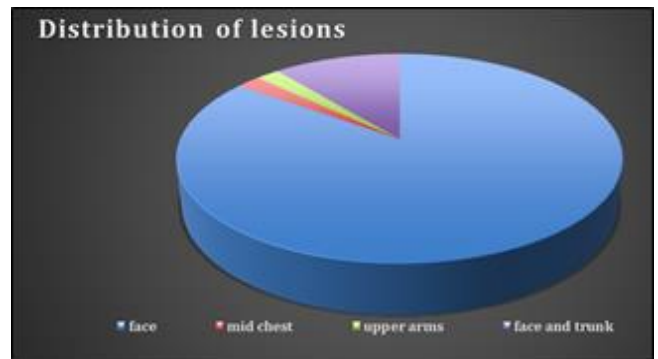
**Table 3: Incidence of Family History in Patients with Nodulocystic Acne**

Total no.of patients with a family history of nodulocystic acne	Males	Females
25	25	0

Out of 41 male patients 25 patients gave a family history of acne i.e 55.55%.

None of the female patients gave any family history of acne

**Distribution of Acne**



**Fig 4: Distribution of Acne**

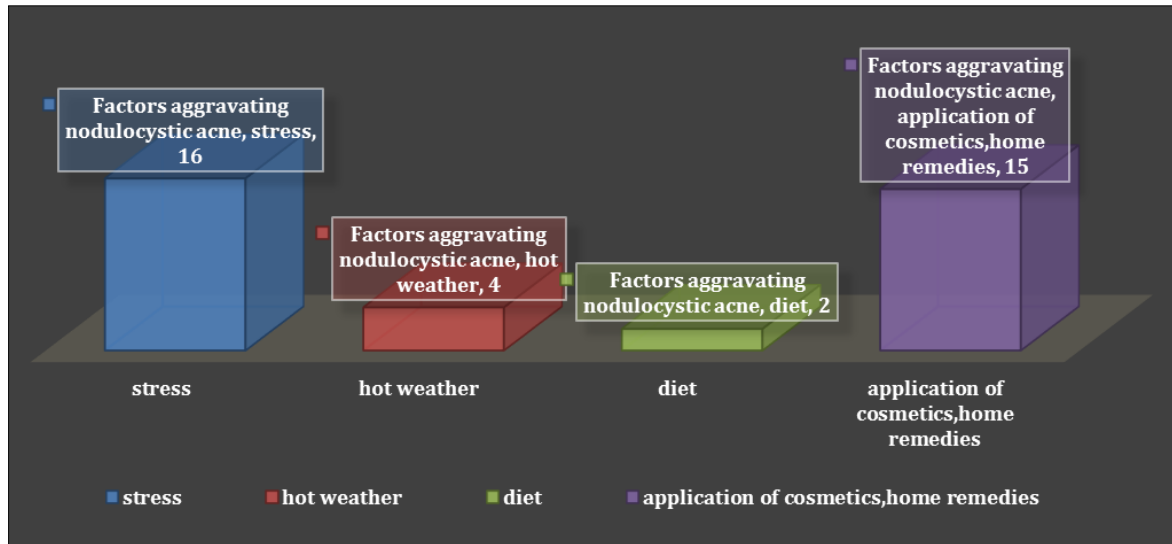
**Table 4: Distribution of Acne**

Site of lesions	No.of patients	% of total patients
Face	38	85%
Mid chest	01	02%
Upper arms	01	02%
Back	00	00%
Shoulders	00	00%
Face and trunk	05	11%
Scalp	00	00%

Most common sites for the lesions of nodulocystic acne was face followed.

By face and trunk and least common site was mid chest and upper arms

**Aggravating factors**



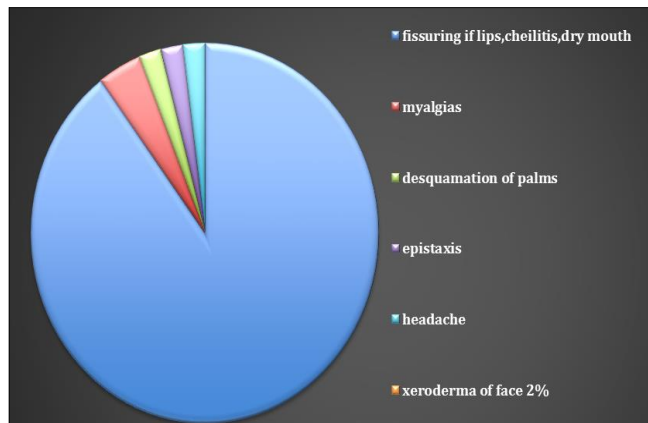
**Fig 5:** Aggravating Factors

**Table 5:** Aggravating Factors

Factors	Total no.of patients	% of total patients
stress	16	35.55%
Hot weather	04	8.88%
diet	02	4.44%
Application of cosmetics, home remedies	15	33.33%

So most common aggravating factors for nodulocystic acne was stress and least common was diet.

cheilitis, dry and sore mouth.



**Fig 6:** Adverse Effects of Isotretinoin

**Table 6:** Adverse Effects of Isotretinoin

Adverse effect	Total no.of patients	Percentage of patients
Fissuring of lips, cheilitis, dry and sore mouth	39	88%
myalgias	2	4%
Desquamation of palms	1	2%
epistaxis	1	2%
headache	1	2%
Xeroderma of face	1	2%

The most common adverse effect observed in the study was fissuring of lips,

**Duration of Acne**



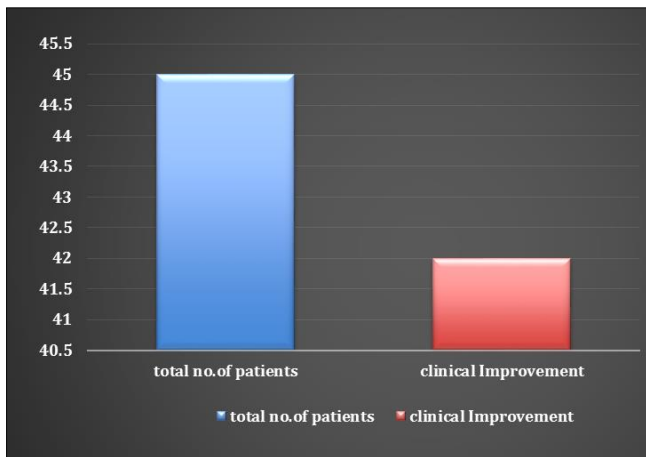
**Fig 7:** Duration of Acne

**Table 7:** Duration of Acne

Duration of Acne	No. of Patients	% of Patients
0-3 Months	7	15.55%
3-6 Months	9	20%
6-9 Months	13	28.88%
9-12 Months	16	35.55%

The maximum number of patients reported between 9-12 months of having acne.

**Number of Patients Showing Clinical Improvement**  
(reduced nodule count and reduced seborrhea after treatment)



**Fig 8:** Number of Patients Showing Clinical Improvement

**Table 8:** Number of Patients Showing Clinical Improvement

<b>Total Number of Patients Treated</b>	<b>45</b>
<b>Total Number of Patients Showing Clinical Improvement</b>	<b>42</b>

Out of 45 patients treated, 42 showed clinical improvement after treatment with isotretinoin i.e 93.33% of the cases.

**4. Observations**

- In the study isotretinoin was started at a dose of 0.5mg/kg per day in single dose after meals and continued for a period of three to four months depending on the response
- Clinical improvement was seen in 42 out of 45 patients in 12 -16 weeks of time period.
- 22.22%(10 patients out of the total 45)patients had signs of infection (bleeding,pain,tenderness in the nodules and cysts)and were given a course of antibiotics with tetracyclines and azithromycin for a period of 4-6 weeks, then after a gap of 2 weeks isotretinoin was started.
- The most common side effect observed was dryness and fissuring of lips in 88% of the cases, Xeroderma in 2% of the cases, which was managed by moisturizers and emollients.
- 2% of the patients developed epistaxis, which subsided on its own.
- Myalgias were reported in 4% of the patients, desquamation of the palms but not soles was observed in 2% patients.
- 2% patients complained of headache and on neurological and ophthalmological work up.
- No underlying abnormality (pseudo tumor cerebri) were found. Therefore treatment was continued in all the above patients who complained of these minor side effects.
- All routine investigations, LFT, lipid profile were repeated after 1 month and after completion of treatment.
- No significant abnormality was observed in the routine investigations even after completion of treatment.
- Transient elevation in serum triglycerides and total cholesterol was seen in all patients but was not

significant enough to require stoppage of treatment or anti hyperlipidemic treatment.

- Clinical follow up was done for a period of 3 months after completion of treatment.
- 6.66% of the relapsed, however re treatment with isotretinoin was not started in these patients.

**5. Discussion**

Isotretinoin [1] was first synthesized in 1955 and has been studied in Europe since 1971 for the treatment of acne.In 1979 the finding that oral isotretinoin can result in prolonged remissions was published, and even described as “a milestone in dermatologic drug discovery”. It is a first generation retinoid (12 cis retinoic acid) approved by the US FDA in 1982 as an oral retinoid to treat nodulocystic acne (especially those cases which have failed to respond to conventional treatment).Since its launch in 1982 it has shown significant acceptance but till recently it was not used in India due to its non-availability and high cost. It was revolutionized the treatment of acne, it is to acne what steroids were to dermatology in the 1950s [2, 3, 5]

Isotretinoin acts on all the four factors involved in pathogenesis of Acne:

- It reduces sebum production
- It reduces ductal colonization with propionibacterium acnes
- It is anti-inflammatory in action as it modifies monocyte chemotaxis
- It reduces comedogenesis

During the clinical study period of 1 year (January 2018-january 2019) out of the 850 cases of nodulocystic acne, 45 were selected for the study.

True incidence of nodulocystic acne cannot be put in figures for statistical purpose, since all patients were not included in the study group and the study group was small.

In this study only patients with a long history of acne not responding to other treatment were started on isotretinoin [7]. Maximum number of patients (16 out of 45) had a history of 9-12 months of acne before starting treatment with isotretinoin.

Nodulocystic acne comprised of 41.06% of the total cases of acne vulgaris, who attended skin O.P, SIMS. (Refer Majority of the cases were male (76%), only 24% of the 45 cases were female patients. (Refer chart no 3)

Acne vulgaris is common in patients between 15-25 years. Mean age of patients in this study group was 19.6 years (Refer table No3)

Maximum number of patients diagnosed with nodulocystic acne was between the age group of 14-18years(53%)followed by 19-23 years(36%) and lowest number of patients between the age group 24-28(9%) and 29-33(2%).

**6. Conclusion**

Oral isotretinoin appears to have favorable results and the minimal adverse effects in treatment of carefully-selected patients with nodulocystic acne.

**7. Financial Support and Sponsorship**

None

**8. Conflicts of Interest**

There are no conflicts of interest.

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