

**Summer Training at
Mankind Pharma Limited,
New Delhi**

**Dermatology – Insight of Therapies and Market of Anti- Acne, Anti-
Psoriasis and Steroids**

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**MBA Pharmaceutical Management
2015-2017**



**The IIHMR University, Jaipur
2016**

CERTIFICATE

This is to certify that Akanksha Negi has undergone Summer Training in Mankind Pharmaceuticals, New Delhi from 1st April to 31st May 2016.

The Candidate herself completed the project assigned to her during summer training. Her approach to the project was sincere and proactive. This summer training is partial fulfillment of the course requirement recommended for the award of MBA in Pharmaceutical Management.

We wish success in all her future endeavors.



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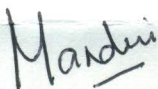
To Whomsoever It May Concern

This is to certify that **Ms. Akanksha Negi**, student of **MBA Pharmaceutical Management** from **IIHMR University** has successfully completed her training entitled **"Dermatology – Insight of Therapies and Market of Anti – acne, Anti – psoriasis and Steroids"** with **Mankind Pharma Ltd.** in **Product Management Team** from **01.04.2016 to 31.05.2016**.

Ms. Akanksha was found to be hardworking, sincere & honest during her training period.

We wish her all the best for future endeavors.

For Mankind Pharma Ltd.



Authorized Signatory

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ACKNOWLEDGEMENTS

First of all, I bow in reverence to the Almighty for blessing me with strong will power, patience and confidence which helped me in completing the present work.

I would like to express my special thanks to Mr. R. C. Juneja (Chairman) & Mr. Rajeev Juneja (CEO) of Mankind Group, New Delhi for providing me an opportunity to join his prestigious Company.

*I would like to express my deep sense of gratitude to **Dr. Sanjay Koul** for providing me a cooperative environment for work.*

It gives me immense pleasure to acknowledge my mentor Mr. Satender Singh, AGM at Mankind Pharma Ltd. for his guidance throughout my Internship; it is the constant encouragement that has enriched my growth as an intern. He has always been an inspiration and will continue to be.

I owe a debt of gratitude to My Mentor Ms Seema Mehta, Associate Professor, at Institute of Health Management Research (IIHMR), Jaipur and all my teachers for grooming me and my classmates for the inspiration needed to work with dedication and motivation throughout as an Intern at Mankind Pharma Ltd., New Delhi.

I hope that I can build upon the experience and knowledge that I have gained and make a valuable contribution towards the industry in coming future.

AKANKSHA NEGI

COMPANY PROFILE

ORGANISATION: MANKIND PHARMA LIMITED.

Established in 1995 with a capital of 50 Lakhs, Mankind at present is a leading pharmaceutical company of India. Goal of the company is to help the community to lead healthy life through two parallel objectives: formulating, developing & commercializing medicines, and delivering affordable & accessible medication that satisfy urgent medical needs.

Mankind has out-performed the Indian Pharmaceutical industry by growing at the rate of 60% year after year. It is among the top 5 fastest growing Pharma companies of India as per ORG- IMS. Mankind is racing towards to achieve the turnover of INR 50000 million.

Ours is a fully integrated pharmaceutical company having pan India presence with a comprehensive network of 50 CFAs agents & 7500+ Stockists. Mankind strong portfolio of businesses, geographies and products provide the strategic benefits of integration that allows company to perform best in an increasingly competitive market.

Mankind have a strong market presence in Antibiotics, Antifungals, Gastrointestinal, NSAIDs, Anthelmintic, Cardiovascular, Dermal and Erectile Dysfunction categories.

DIVISIONS

MANKIND PHARMA

Mankind Pharma focuses on a variety of therapeutic segments such as Cardiovascular, Antibiotics, Gastro-Intestinal, Anti-Allergic, Antifungal, Nutritional, NSAID's and Gynaecological. Mankind has launched many innovative and successful products such as Noragyl, Ranispas, Ranidomin in the Indian market and economical brands like Nurokind, Moxikind and Telmikind..

DISCOVERY MANKIND

Incepted in the year 2002 as a marketing division of Mankind Pharma, today Discovery Mankind is having a wide product range to treat diabetic metabolic disorder. It is also having products in antibiotic, GI, anti-fungal & lifestyle segments.

LIFESTAR PHARMA

Launched in the year 2005 as a group company. Lifestar offers comprehensive range of products in ophthalmic & Dermal segment. It is also having product range in antibacterial, GI & other segments.

SPECIAL MANKIND

Special Mankind launched in January 2007 was poised to meet OTC requirements. It is one of Mankind's fastest growing divisions, renowned for providing OTC and consumer products that include top-selling brands across several categories. Manforce Condom, PregaNews and Unwanted-72 are the flagship brand.

FUTURE MANKIND

Future Mankind was positioned in the year 2007 to cater the growing demand of acute & chronic therapeutic segments. In Future Mankind drugs Neuropsychiatry and Dentistry are the focus segment along with Nutritional, GI & other specialty is comprehensively represented in line to Mankind group philosophy.

VET MANKIND

The strong impact of the philosophy of "Serving Life" lead to the foundation of this division in the year 2007 to serve the Indian animal husbandry needs. It comprises veterinary products in Antibacterials, Nutritionals, Reproductive, NSAIDs, Digestive categories etc.

MAGNET MANKIND

Magnet Mankind began in 2007 Magnet Mankind is committed to achieving customer satisfaction, providing products and services of the highest quality and managing operations with responsibility for safety and environment. Magnet Mankind covers all major therapy areas, including Anti-bacterial, Nutritional, Gastro-intestinal, Pain management, Anti-allergic and Central Nervous System

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INTRODUCTON

Dermatology is the branch of medicine that deals with the skin, nails, hair and its diseases. It is a specialty with both medical and surgical aspects. A dermatologist treats diseases, and some cosmetic problems of the skin, scalp, hair, and nails.

The human skin is the outer covering of the body and it is the largest organ of the integumentary system. Our body is absolutely dependent on this 2 m² of barrier separating the potentially harmful environment from body's vulnerable interior. The skin has multiple layers of ectodermal tissue and guards the underlying muscles, bones, ligaments and internal organs.

The adjective cutaneous literally means "of the skin". Skin disease is very common. However "healthy" our skin is, it is likely that skin is suffered from some degree of acne and may be one or other of the many common skin disorders.

Skin disorders are not often dramatic, but cause considerable discomfort and much disability. The disability caused is physical, emotional and socioeconomic.

Function:

Source: <http://www.ivyroses.com/HumanBody/Skin/Functions-of-the-Skin.php>



Figure 1

Structure:

Source: American Academy of dermatology

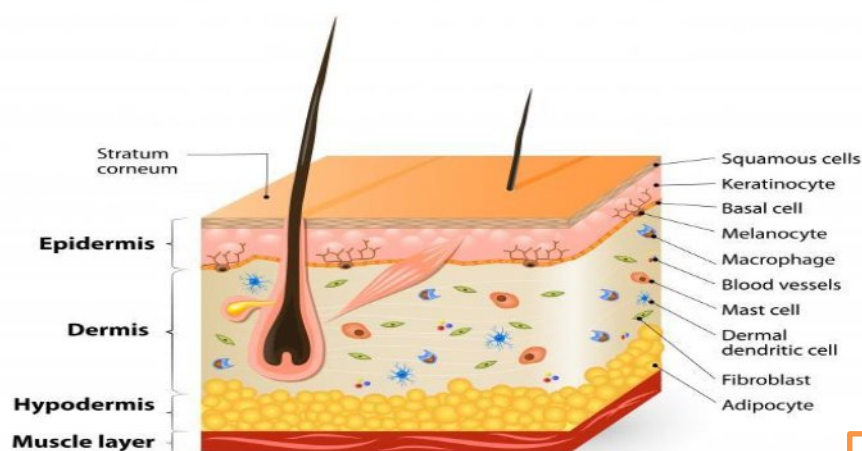


Figure 2

Skin has mesodermal cells, pigmentation, such as melanin provided by melanocytes, which absorb some of the potentially dangerous ultraviolet radiation (UV) in sunlight.

It also contains DNA repair enzymes that help reverse UV damage, such that people lacking the genes for these enzymes suffer high rates of skin cancer.

Skin is composed of three primary layers: the epidermis, the dermis and the hypodermis.

Epidermis

It is the top layer of skin that protects body from invasion and infection and helps to seal in moisture. It's built up of several layers of living cells that are topped by sheets of dead cells. Most of the cells in the epidermis are keratinocytes. They originate from cells in the deepest layer of the epidermis called the basal layer. The epidermis is responsible for colouring, as it holds the skin's pigment.

Dermis

The dermis is the layer of skin beneath the epidermis that consists of connective tissue and cushions the body from stress and strain. The dermis provides tensile strength and elasticity to the skin through an extracellular matrix composed of collagen fibrils, microfibrils, and elastic fibres, embedded in hyaluronan and proteoglycans. The most important function of dermis is respiration. The countless tiny blood vessels or capillaries end here in finely-drawn networks, from where they feed the outer skin layer. Dermis also determines the tone of the skin.

Hypodermis

The hypodermis is not part of the skin, and lies below the dermis. Its purpose is to attach the skin to underlying bone and muscle as well as supplying it with blood vessels and nerves. It consists of loose connective tissue, adipose tissue and elastin. The main cell types are fibroblasts, macrophages and adipocytes. Fat serves as padding and insulation for the body.

Diseases related to Skin:

- SKIN CANCER
- LUPUS
- ACNE
- BASAL CELL CARCINOMA
- BOWEN'S DISEASE
- CONTACT DERMATITIS
- DYSTROPHIC EPIDERMOLYSIS BULLOSA
- ECZEMA (ATOPIC ECZEMA)
- FUNGAL INFECTIONS OF NAILS
- HERPES SIMPLEX
- HIVES
- ICHTHYOSIS
- KELOIDS
- MELANOMA
- MELASMA
- PSORIASIS
- ROSACEA
- SCABIES
- SQUAMOUS CELL CARCINOMA
- VITILIGO

ACNE

INTRODUCTION

The word acne comes from the word acme meaning "the highest point," which comes from the Greek acme meaning "point" or "spot."

Acne vulgaris (or simply acne) is a long-term skin disease which occurs when hair follicles become clogged with dead skin cells and oil from the skin. Acne is not dangerous, but can leave skin scars.

Human skin has pores (tiny holes) which connect to oil glands located under the skin. The glands are connected to the pores via follicles - small canals. These glands produce Sebum. The sebum carries dead skin cells through the follicles. Pimples grow when these follicles get blocked, resulting in an accumulation of oil under the skin.

During puberty, in both sexes, acne is brought on by an increase in androgens such as testosterone. Excessive growth of the bacteria *Propionibacterium acnes*, present on the skin, is often involved.

Synopsis of Acnes

Acne nonatorum

Acne infantum

- Acne conglobate infantum
- Acne venata infantum
- Steroid acne in infants
- Chlorance in children

Acne in puberty and adulthood

- Acne comedonica
- Acne papulopustulosa
- Acne conglobata
- Acne inversa
- Acne fulminans
- Solid persistent facial edema in acne
- Acne mechanica
- Acne on back in adults
- Acne tropicalis
- Androgen excess in men
 - I. XYZ acne conglobate
 - II. Body building acne
 - III. Testosterone induced acne fluminans in extremely tall boys
 - IV. Adrenocortical syndrome

Acne venenata (contact acne)

- Acne cosmetic
- Pomade acne
- Chloracne (skin contactants , inhalants , ingestants)
- Oil, Tar and pitch acne
- Comedonal acne due to physical agents
- Solar comedones

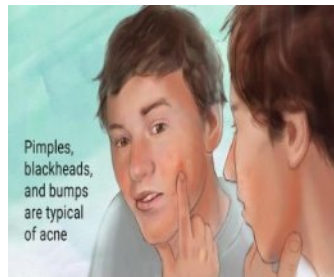


Figure 3

Symptoms:

Acne is commonly classified by severity as mild, moderate, or severe.

1. Blackheads – These type of acne are extremely common and are usually seen on the nose and nasal area. They look like tiny areas of black lumps on the skin, which are formed as a result of blocked follicles.
2. Whiteheads -These are white spots on the skin that are, in fact, oil glands. Due to excessive oil production, the glands are clogged with oil and covered by skin
3. Papules - Papules are a type of acne that are inflamed and appear as small red dots or bumps on the skin. These may or may not be sensitive to touch, but refrain from picking on the rashes, as it can result in scars.
4. Pustules - Pustules are inflamed acne that are hard to touch and are usually filled with pus. These appear as white spots and the centre is mostly pale yellow. Refrain from picking or bursting, as it can lead to permanent scarring or leave dark spots.
5. Nodules - This is one of the more severe types of acne which is much larger than papules or pustules. A nodule is a painful and inflamed bump. It doesn't have pus and is hard to the touch.
6. Cyst - Acne that is deep, appears big, and is pus filled, is called a cyst. It is quite painful to touch and needs immediate attention from a doctor.

Grade of Acne

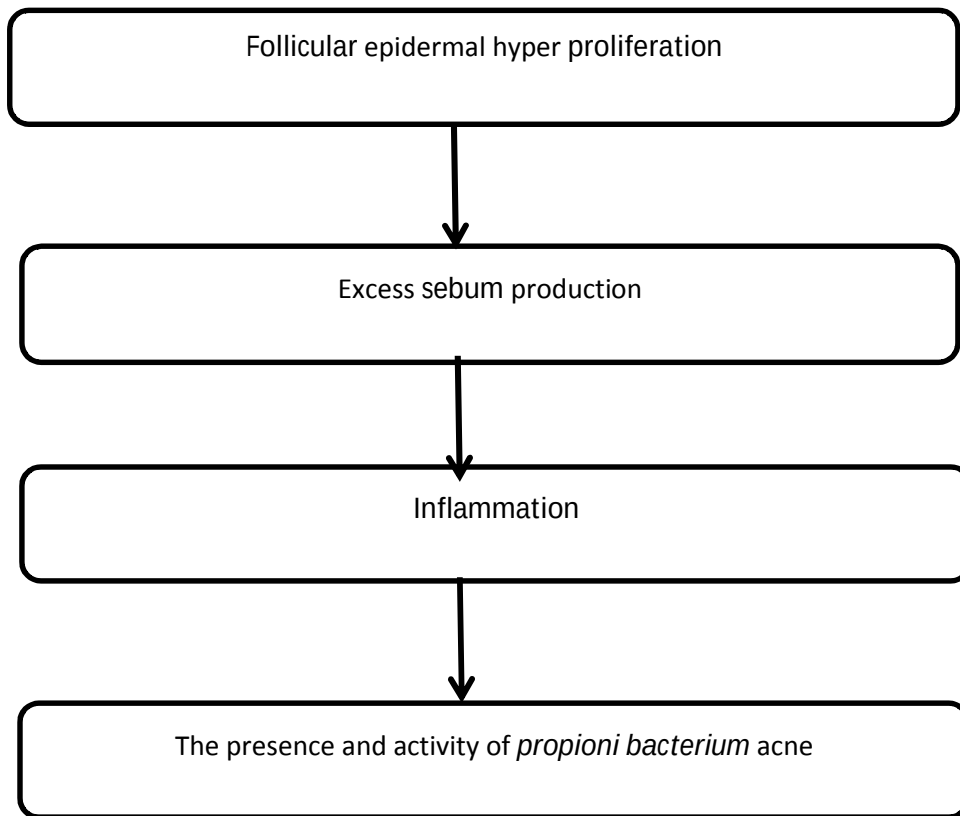
1. Grade 0 – Clear skin with no inflammatory or non- inflammatory lesions.
2. Grade 1 – Almost clear, rare non- inflammatory with no more than one small inflammatory lesion.
3. Grade 2- Mild severity , greater then Grade 1, some non- inflammatory lesion with no more than few inflammatory lesions.
4. Grade 3- Moderate severity, greater than Grade 2, up to many non- inflammatory lesions and may have inflammatory lesion, but no more than one active small nodular lesion.
5. Grade 4 – Severe, greater than Grade 3, up to many non- inflammatory and inflammatory lesions, but no more than a few active nodular lesions.



Figure 4

Source : <https://www.medicalwellnesscenter.com/Epiduoquestionsandanswers.htm>

Pathophysiology



Treatment for Acne

Many treatment of acne are present, different forms of familial or folk treatment seems to be more in the nature of punishments than anything else. Dietic and social restrictions are typical, which is another tactic adopted but misguide family and friends.

Fortunately, many patients improves spontaneously after few months while other who don't find their way to the pharmacist and purchase preparations containing benzoyl peroxide or anti-microbial compounds, or sulphur or salicylic acid. Only those with resistant, recalcitrant and more severe types of acne reach the physician.

Acne medications work by:

- ✓ Reducing the bacterial population of the hair follicles by cutting down the hydrolysis of lipids.
- ✓ Encouraging , shedding of the follicular plugs
- ✓ Reducing the rate of sebum production either by acting on sebaceous glands or by inhibiting the effects of androgens.
- ✓ Reducing the damaging effects of acne inflammation.

1. Topical Treatment

Topical preparations present for acne are gel, cream or alcohol based lotions.

Topical retinoids

They are comedolytics and come as creams, gels and lotions. Retinoid drugs are derived from vitamin A and include tretinoin (Avita, Retin-A, others), adapalene. It works by preventing plugging of the hair follicles. The side effects from the use of these preparations include some pinkness and slight scaling of skin surface.

Sulphur is traditional treatment for acne. Its efficacy probably depends on both its antimicrobial actions and its comedolytic activity.

Other agents employed are abrasive preparations. They contain particles of substances like aluminium oxide or polyethylene beads.

Topical antibiotics

They work by killing excess skin bacteria and reducing redness. Erythromycin (1-2%) and clindamycin (2%) are effective for mild and moderate types of acne. Tetracycline preparations are less effective. These antibiotics have a low tendency to sensitize and they are not responsible for dermatitis, although they can cause a minor degree of direct primary irritations.

Azelaic acid 20 % cream.

Sodium sulfacetamide- sulphur combination, gel, lotion, wash.

2. Oral Treatment

Antibiotic

Choices for treating acne by oral antibiotics include minocycline and doxycycline, generally taken for treating mild to severe acnes. Studies have found that using topical benzoyl peroxide along with oral antibiotics can reduce the risk of developing antibiotic resistance.

They may cause side effects, such as an upset stomach and dizziness. These drugs also increase skin's sun sensitivity. They can cause discoloration of developing permanent teeth and reduced bone growth in children born to women who took tetracyclines at the time of pregnancy.

Combined oral contraceptives

The Food and Drug Administration has approved three products Ortho Tri-Cyclen, Estrostep and Yaz that combine estrogen and progestin.

The most common side effects of these drugs are headache, breast tenderness, nausea, weight gain and breakthrough bleeding. Serious side effects of this medication include risk of blood clots.

Anti-androgen agent.

They act by inhibiting androgenic activity and reduce sebum secretion. Only one anti- androgenic preparation is available – Dianette. It blocks the pituitary drive to androgen secretion. It also suppresses ovulation and acts as oral contraceptive. It treats acne after 6 – 8 weeks, but is not effective as isotretinoin.

The drug Spironolactone (Aldactone) may be considered for women and adolescent girls if oral antibiotics aren't helping. It also works by blocking the effect of androgen hormones on the sebaceous glands.

Possible side effects include breast tenderness, painful periods and the retention of potassium.

Isotretinoin

There are severely affected patients that may not respond to topical or some combination of systemic or oral drugs. Isotretinoin (the same cis- isomer of tretinoin is used topically). It reduces sebum secretion by shrinking the sebaceous glands and may also alter keratinization of hair follicle and have anti- inflammatory action.

Isotretinoin (Amnesteem, Claravis, Sotret) is a powerful drug for people whose acne doesn't respond to other treatments.

Oral isotretinoin is very effective. But because of its potential side effects, doctors need to closely monitor anyone they treat with this drug.

The most common side effects are drying and cracking of lips and the most serious potential side effects include hepatotoxicity, bone toxicity, blood-lipid elevating effect, ulcerative colitis, an increased risk of depression and suicide, severe birth defects.

In fact, isotretinoin carries such serious risk of side effects that women of reproductive age must participate in a Food and Drug Administration-approved monitoring programs to receive a prescription for the drug.

[3. Therapies](#)

These therapies may be suggested in select cases, either alone or in combination with medications.

- Light therapy. A variety of light-based therapies have been tried with success. Light therapy targets the bacteria that cause acne inflammation. Blue-light therapy can be done at home with a hand-held device.

Possible side effects of light therapy include pain, temporary redness and sensitivity to sunlight.

- Chemical peel. This procedure uses repeated applications of a chemical solution, such as salicylic acid. It is most effective when combined with other acne treatments, except oral retinoids. Chemical peels aren't recommended for people taking oral retinoids because together these treatments can significantly irritate the skin.

Chemicals peels may cause temporary, severe redness, scaling and blistering, and long-term discoloration of the skin.

- Extraction of whiteheads and blackheads. Dermatologist uses special tools to gently remove whiteheads and blackheads (comedos) that are not cleared up by topical medications. This technique might cause scarring.

[Treating acne scars](#)

Procedures used to diminish scars left by acne include the following:

- Soft tissue fillers. Injecting soft tissue fillers, such as collagen or fat, under the skin and into indented scars can fill out or stretch the skin. This makes the scars less noticeable. Its results are temporary, so repeat the injections periodically. Side effects include temporary swelling, redness and bruising.
- Chemical peels. High-potency acid is applied to your skin to remove the top layer and minimize deeper scars.
- Dermabrasion. This procedure is usually reserved for more severe scarring. It involves sanding (planing) the surface layer of skin with a rotating brush. This helps blend acne scars into the surrounding skin.
- Laser resurfacing. This is a skin resurfacing procedure that uses a laser to improve the appearance of your skin.
- Light therapy. Certain lasers pulsed light sources and radiofrequency devices that don't injure the epidermis can be used to treat scars. These treatments heat the dermis and cause new skin to form. After several treatments, acne scars may appear less noticeable. This treatment has shorter recovery times than some other methods. But you may need to repeat the procedure more often and results are subtle.
- Skin surgery. Using a minor procedure called punch excision, your doctor cuts out individual acne scars and repairs the hole at the scar site with stitches or a skin graft.

Ten Life style steps to help your acne:

1. Get more sleep
2. Tweak your diet, avoid pro-inflammatory foods
3. Get some exercise
4. Sip water
5. Say “yes” to screen
6. Become a fan of omega -3 fatty acids
7. Cleanse twice a day
8. Exfoliate
9. De germ your cell phone
10. Style strands strategically

General guidelines for treatment of acne –

- a) Oral cyclines should be considered as a first choice when treating acne.
- b) First generation tetracyclines should be considered as third choice.
- c) Optimal dosage for antibiotics in acne should be 300-600mg/ day for lymecycline
- d) Topical antibiotic should not be used as monotherapy.
- e) Combination Therapy is now considered standard care for mild to moderate acne. Antimicrobial therapy + tropical retinoid is significantly better than antimicrobials alone.
- f) Topical retinoid and benzoyl peroxide can be used in combination on alternate days or in morning and night.
- g) Maintenance Therapy – Micromedo is the precursor of all acne lesions. Avoiding micromedo formation has preventive effect in acne. They are the main target of topical retenoids.

Epidemiology of Acne

Epidemiology is the study and analysis of the patterns, causes, and effects of health and disease conditions in defined populations. It is the cornerstone of public health, and shapes policy decisions and evidence-based practice by identifying risk factors for disease and targets for preventive healthcare.

(Goulden V, 1999) A degree of facial acne was recorded in 231 women and 130 men, giving an overall prevalence of 54% in women and 40% in men ($P < .001$). The acne observed in volunteers consisted principally of physiological acne, but clinical facial acne (grade > 0.75) was recorded in 3% of men and in 12% of women ($P < .001$). The prevalence of acne did not substantially decrease until after the age of 44 years ($P < .001$).

(Raj Kubba, 2009) Acne vulgaris is a nearly universal skin disease afflicting 79-95% of the adolescent population in westernized societies. It was also recorded in 54% of women and 40% of men over 25 years of age. Other studies have reported acne in 28-61% of school children in the age group 10-12 years; 79-95% in the age group 16-18 years and even in children in the age group 4-7 years.

(Silverberg & Silverberg, 2014) The prevalence of Acne was nearly nil in U.S in first decade of life, but has increased linearly in 11 years to 17 years of age. Severe acne was more common in Whites compared with other racial groups at age 14–15 years and girls at age 11–13.

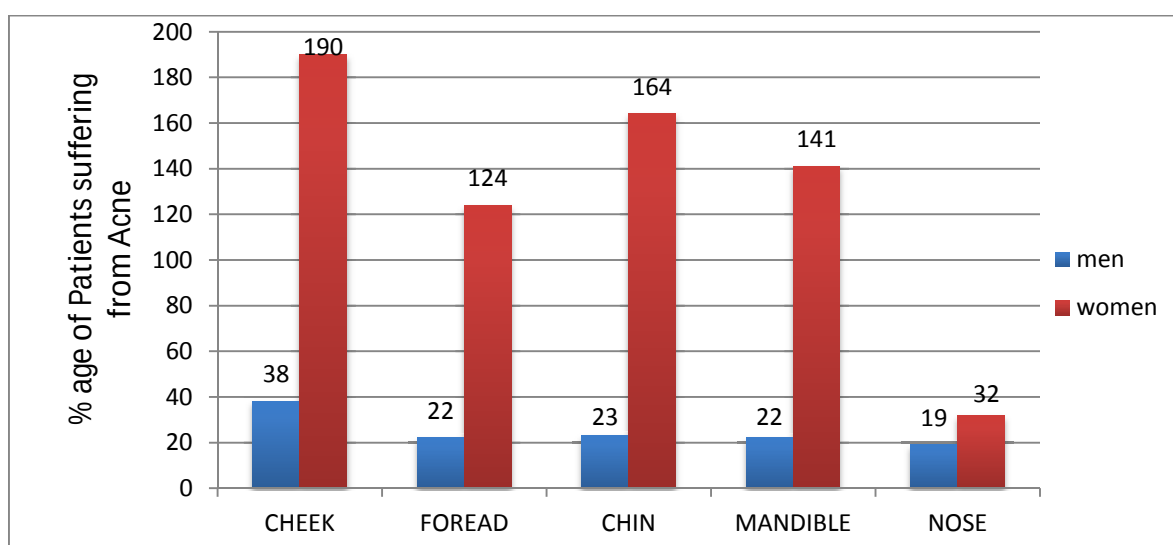
Severe acne was associated with a number of comorbid disorders. Sino pulmonary disease included sinus infection ($P = 0.0003$), sore throat other than strep infection ($P = 0.0003$), asthma ($P = 0.03$) and no asthmatic lung disease ($P = 0.03$). Upper gastrointestinal comorbidities included reflux/heartburn ($P = 0.0003$), abdominal pain ($P = 0.03$), nausea/vomiting ($P = 0.0001$) and food/digestive allergy ($P = 0.01$). Psychological comorbidities included depression ($P = 0.02$), anxiety ($P < 0.0001$), attention deficit disorder/attention deficit hyperactivity disorder ($P = 0.01$) and insomnia ($P = 0.02$).

(Williams, 28 FEB 2013) Moderate-to-severe acne affects around 20% of young people and severity correlates with pubertal maturity. Black individuals are more prone to post inflammatory hyperpigmentation and specific subtypes such as ‘pomade acne’. Acne persists into the 20s and 30s in around 64% and 43% of individuals, respectively. The heritability of acne is almost 80% in first-degree relatives. In the U.S.A., the cost of acne is over 3 billion dollars per year.

(Ediléia Bagatin1, 2013) 62.4% were female, 85.8% white and 6.4% were aged 14. The prevalence was 96.0% and increased with age - all students over 14 had acne.

(Priya Cinna T Durai, 2015) Acne vulgaris is a chronic condition affecting more than 85% of adolescents and young adults. Face (139, 99.3%) was the commonest site of acne and comedones 133, 95% were the commonest type of lesion. Most of the individuals 66, 47.1% were observed to have grade 1 acne.

%age of Patients suffering from Acne



Source: Khunger Niti, Kumar Chandan (2012). A clinico-epidemiological study of adult acne: Is it different from adolescent acne?, Indian Journal of Dermatology, Venereology and Leprology, Volume 78, Page no- 335-341.

Graph 1

Future of Anti-Acne

Different anti acne drugs are used for different purposes. For example, lotions, soaps, gels, creams, containing benzoyl peroxide or tretinoin may be used to clear up mild to moderately severe acne. Isotretinoin is prescribed only for very severe, disfiguring acne.

Based on the present overview a recommendation for the treatment of various manifestations of acne is provided, also reconciling beneficial combinations of treatments. It is attractive to speculate that the increased insight into the pathogenesis of acne will create new treatment options. Challenging new options comprise blue light, photodynamic therapy, retinoic acid metabolism blocking agents and inhibitors of Th-1 cytokines.

New developments and future trends represent low-dose long-term isotretinoin regimens, new isotretinoin formulations (micronized isotretinoin), isotretinoin metabolites, combination treatments to reduce toxicity, insulin-sensitizing agents, 5--reductase , type 1 inhibitors, antisense oligonucleotide molecules, and, especially, new anti-inflammatory agents, such as lipoxygenase inhibitors C.

(Priyam Sinha, 2014) Today bacterial resistance is at the alarming stage because of irrational use of antibiotics. Hence, search for new lead molecule/bioactive and rational delivery of the existing drug (for better therapeutic effect) to the site of action is the need of the hour.

1. Plants and plant-derived products have been an integral part of health care system. Most active plant extracts, namely, *P.granatum*, *M.alba*, *A.anomala*, and *M.aquifolium* exhibit minimum inhibitory concentration in the range of 4-50 $\mu\text{g/mL}$.
2. Aromatic oils of *C. obovoides*, *C. natsudaoidai*, *C.japonica*, and *C.nardus* exhibit MIC'S in the range of 0.005-0.6 $\mu\text{g/mL}$
3. Phtyomolecules such as rhodomyrtone, pulsaquinone, hydropulsaquinone, honokiol, magnolol, xanthohumol lupulones, chebulagic acid and rhinacanthin-C shows MIC'S in the range of 0.5–12.5 $\mu\text{g/mL}$.

OTC and Prescription Drugs available for Acne treatment

OTC drugs that are available for the treatment of Acne are

- Alpha Hydroxy acids (AHAs) it include glycolic acid and lactic acids.
- Benzoyl Peroxide strength ranging from 2.5 % up to 10 %.
- Clay is used because of its anti- inflammatory properties.
- Salicylic acids are a beta-hydroxy acid an effective and powerful exfoliant that keeps pores clear by exfoliating inside the hair follicle.
- Tea tree oil, are natural blemish-fighter having antibacterial and anti-inflammatory properties to help calm acne.

Prescription drugs that is available for treating Acne –

- Antibiotics that are used orally includes tetracycline, doxycycline,minocycline,erythromycin and topically used drugs include erythromycin and clindamycin.
- Azelaic acid act by killing bacteria and exfoliates the dead skin cells that can plug up pores.
- Birth control pills are used in combination with benzoyl peroxide or salicylic acid . These drugs include estrogen , progestin.
- Oral retenoids - Isotretinoin
- Topical Retenoids includes vitamin A derived topical retenoids, like tretinoin, adapalene, tazarotene.

Finally, some misconception should be addressed.

- Avoidance of specific food is not necessary.
- Scrubbing will not only increase irritation but may worsen acne.
- Utilization of prescribed medication and avoidance of potential drying otc products.
- Non- comedogenic cosmetics are recommended and pressed powders and oil based products should be avoided.

Psoriasis

INTRODUCTION

Psoriasis is a common, chronic, and recurrent inflammatory disease of the skin characterized by erythematous, dry, scaling plaques of various sizes. The lesions are usually covered by silvery white lamellar scales. They have predilection for the scalp, nails, extensor surface of the limbs and sacrum. Symptoms such as itching or burning may be present and can cause extreme discomfort.

The early lesions are small erythematous macules, that are covered with dry, silvery scales. The lesion increases in size by peripheral extensions. The scales are loose towards periphery and adherent centrally, If removed bleeding points appear.

Types of Psoriasis

1. Plaque Psoriasis
2. Guttate Psoriasis
3. Inverse Psoriasis
4. Generalized Pustular
5. Psoriatic Arthritis
6. Nail Psoriasis
7. Erythrodermic Psoriasis.



Figure 5

Symptoms:

Psoriasis signs and symptoms can vary from person to person but may include one or more of the following

1. Red patches of the skin covered with silvery scales
2. Small scaling spots (commonly seen in children)
3. Streptococcal throat infection, viral infection, immunization, use of antimalarial drug, or trauma.
4. Dry, Cracked skin that may bleed.
5. Itching , burning, soreness
6. Thickened, pitted or ridged nails.
7. Swollen and stiff joints

Psoriasis patches can range from a few spots of dandruff-like scaling to major eruptions that cover large areas. Most types of psoriasis go through cycles, flaring for a few weeks or months, then subsiding for a time or even going into complete remission.

Severity of Psoriasis

Psoriasis severity is measured by The Psoriasis Area and Severity Index (PASI) scale. They are characterized as mild, moderate, and severe.

1. Mild Psoriasis –

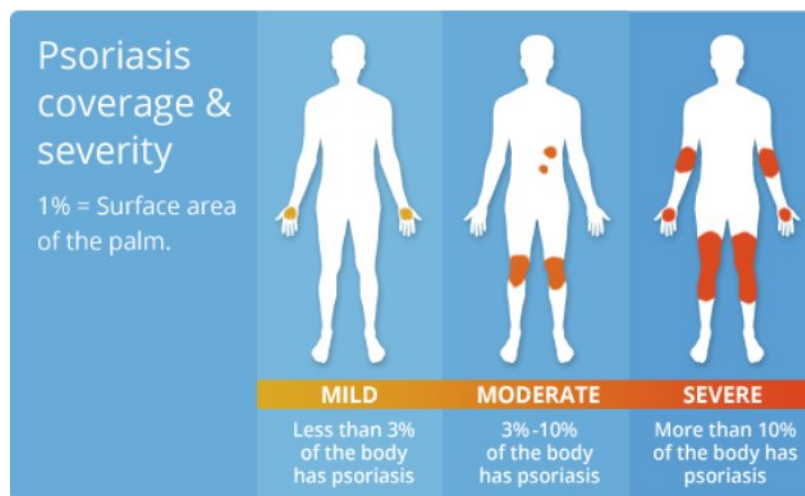
- Covers less than 3% of the body
- Usually occurs on the hands, feet, elbows, knees, or scalp

2. Moderate Psoriasis-

- Covers 3%- 10% of the body
- Usually occurs in hands, feet, elbow, knees , scalp, arms or torso.

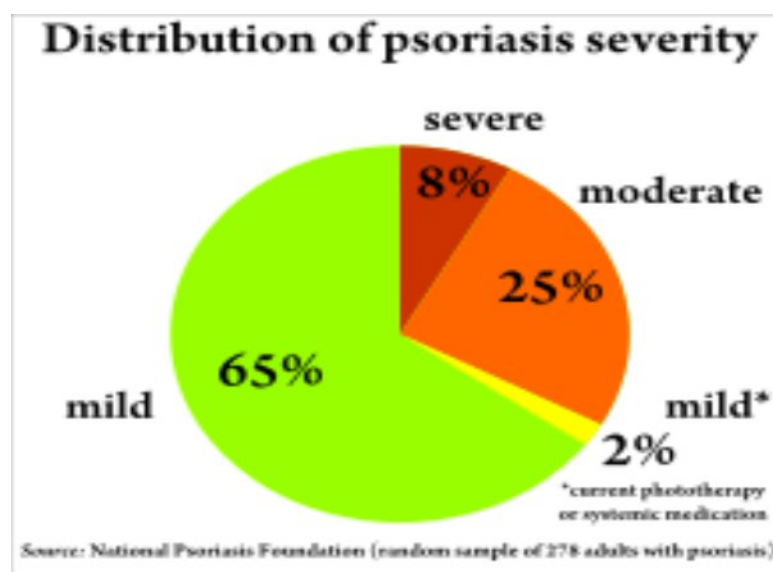
3. Severe Psoriasis –

- Covers more than 10% of the body.
- Usually affects large area of the body.
- If sensitive area such as face, palms, and soles of feet are affected, it is considered as severe.



Source : <http://healthment.com/top-10-best-natural-home-remedies-for-psoriasis-skin-disease/>

Figure 6

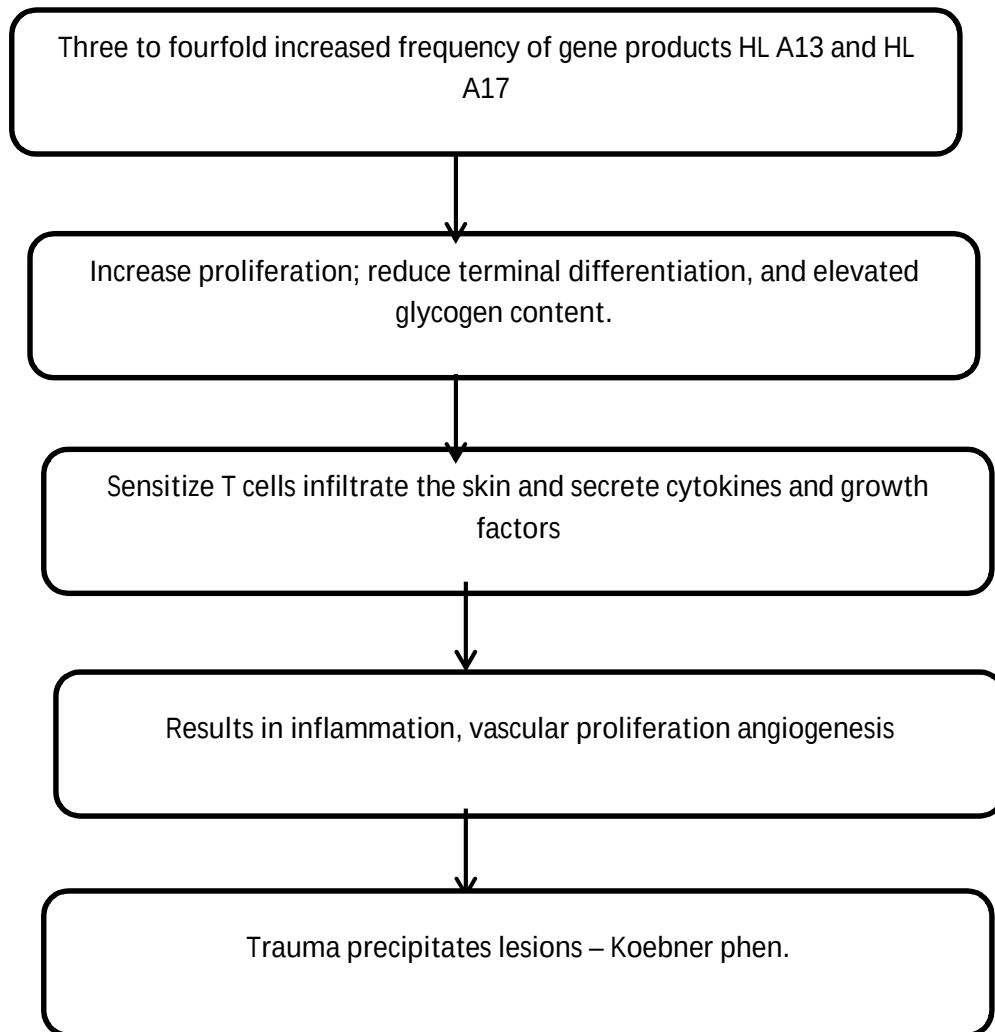


Graph 2

Pathophysiology –

(Voorhees, 1977)

It is a multifactorial genetic and immune disease



Treatment of Psoriasis

Psoriasis is considered to be one of the most difficult skin conditions to treat. Wide range of treatments is available for psoriasis and there is no cure for psoriasis but several new medications have recently been introduced and on-going research looks promising. Treatments are determined by the type and severity of psoriasis and the area of skin affected. Treatment is generally started with a mild treatment, such as topical creams (which are applied to the skin), and then move on to stronger treatments.

A wide range of treatments are available for psoriasis, but identifying which treatment is most effective can be difficult.

Psoriasis treatments aim to:

- ✓ Stop the skin cells from growing quickly, which results in reduction of inflammation and plaque formation.
- ✓ Removes scales and smoothen the skin, that is true for topical treatment.

Topical Treatment –

They are used alone as creams and ointments and can effectively treat mild to moderate psoriasis. When the disease is more severe, creams are likely to be combined with oral medications or light therapy. Topical psoriasis treatments include:

Corticosteroids

Topical application of corticosteroids in creams, ointments, lotion, foams and sprays are most frequently prescribed therapy of psoriasis. Class 1 steroids are suitable for two weeks. On the scalp, corticosteroids in propylene glycol, gel, foam, and spray bases forms are used preferably.

Intralesional injections of triamcinolone are helpful for refractory plaques.

Tars

Crude coal tar and tar extracts such as liquor carbonis detergent can be compounded into agents for topical use. Tar bath oils and shampoos are readily available. Pine tar or birch tar in concentration of 5% - 10% can be incorporated into ointments. The odor of all tars can be offensive.

Anthralin

It is effective, but irritating and stains skin, clothing and bedding. For avoiding these SCAT – Short Contact Anthralin treatment can be effective. Anthralin exerts a direct effect on keratinocytes and leukocytes by suppressing neutrophils and IL-6, IL-8 and TNF- α

Tazarotene

It is nonisomerizable retinoic acid receptor specific retinoid. It treats by modulating keratinocyte differentiation and hyperproliferation and suppressing inflammation.

Calcipotriene

Vitamin D3 affects keratinocyte partly through its regulation of epidermal responsiveness to calcium. Treatment with vitamin D analog in ointment, cream, solution is effective in treatment of plaque-type and scalp psoriasis. Calcipotriene degrades in presence of UV lights.

Macrolactams (Calcineurin inhibitors)

Topical macrolactams such as tacrolimus and pimecrolimus are helpful for thin lesions. They cause disruption in activation of T cells, that reduces inflammation and plaque buildup. They are not used for long term because of risk of skin cancer and lymphoma.

Salicylic Acid

It promotes sloughing of dead skin cells and reduces scaling. It is used as keratolytic agent in shampoos, creams, gels. It can promote the absorption of other topical agents.

Light Therapy

This psoriasis treatment uses natural or artificial ultraviolet light. The simplest and easiest form of phototherapy involves exposing skin to controlled amounts of natural sunlight.

Ultraviolet Light

In most instances sunlight improves psoriasis. Burning of skin causes Koebner's phenomenon. Maximal effect is usually achieved at minimal erythemogenic doses (MED). With treatment tanning response occurs.

Using a monochromator, shows that wavelength of 254,280 and 290 nm are ineffective ; at 296,300,304 and 313 nm there is clearing . Narrow-band UVB wavelength around 311 nm is much effective in treating psoriasis.

Goeckerman Technique

It is effective and cost effective technique. 2-5% tar preparation is applied to skin for tar bath. Excessive tar is removed and UV light is given. The two therapies together are more effective than either alone because coal tar makes skin more receptive to UVB light. Phototoxic reaction occurs as a result of UVA generated by UVB bulbs.

Ingram Techniques

It consists of daily coal tar bath in solution such as 120ml liquor carbonis detergent to 80L of warm water. An anthralin paste is then applied to psoriatic plaques, Further talcum powder is sprinkled over the lesions. Modern of technique employ SCAT.

PUVA Therapy

High intensity low wave UV radiation given for 2hr after ingestion of 8-methoxypsoralen, twice a week , is highly effective , even in severe psoriasis. PUVA therapy is highly effective in patients with less than 50% skin surface affected. It is alternative to oral psoralen –UVA. Oral psoralen can produce cataracts, and protective eye wear must be used.

Surgical Treatment

In patients with pharyngeal colonization, tonsillectomy method can be used. Treatment with the use of dicloxacillin + rifampin (600mg/day) has replaced tonsillectomy.

Systemic Treatment

Corticosteroids

There is hazard of using corticosteroids. The risk of rebound or induction of pustular psoriasis occurs when therapy is stopped.

Methotrexate

It has greater affinity for dihydrofolic acid reductase than folic acid. Synthesis of DNA is blocked and then cell division is reduced. It is used in psoriatic erythroderma, psoriatic arthritis ,acute pustular psoriasis or widespread body surface involvement.

It can be toxic to liver and decrease renal clearance that enhance toxicity.

Cyclosporin

The therapeutic benefit of cyclosporin in psoriatic disease may be related to down modulation of proinflammatory epidermal cytokines. Treatment duration up to 6 months is associated with a low incidence of renal complications, but blood pressure and serum creatinine must be monitored, and dose adjusted accordingly. Usually the dose is reduced if the baseline creatinine increases by a third.

Oral

Oral bile acid supplementation improves psoriasis by affecting microflora and endotoxin in the gut. Oral ketoconazole, itraconazole and other antibiotics show fewer efficacies.

Retinoids

Oral treatment with aromatic retinoid ethylester is effective in many patients especially in pustular disease. Combination of retinoic acid with photo chemotherapy can be effective in chronic plaque psoriasis.

Dapsone

Dapsone use is limited to treat pustular psoriasis. It is second or third line agent.

Biological agents

Biologic agents are important treatment options for moderate to severe plaque type psoriasis. The available biologics for psoriasis have excellent short-term and long-term efficacy and favorable tolerability. Biologic therapies available for the treatment of psoriasis include etanercept, infliximab, adalimumab, ustekinumab and secukinumab.

The biologics used to treat psoriatic disease block the action of a specific type of immune cell called a T cell, or block proteins in the immune system, such as tumour necrosis factor-alpha (TNF-alpha), interleukin 17-A, or interleukins 12 and 23

Life style steps to treat Psoriasis

1. Take daily baths by adding bath oil, colloidal oatmeal, Epsom salts, Dead Sea salts.
2. Use moisturiser
3. Expose skin to small amounts of sunlight, but too much sun can trigger or worsen outbreaks and increase the risk of skin cancer.
4. Avoid psoriasis trigger that includes – infections, injuries to skin, stress, smoking and intense sun exposure
5. Avoid drinking alcohol
6. Exercise also helps in managing stress
7. Taking proper diet helps in treating Psoriasis Vitamin A and beta carotene improve scaling of skin, Vitamin B6 and folic acid makes the skin healthy and regulates cell growth. Consume probiotics like curd for controlling overgrowth of *Candida albicans*. Include foods that contain essential fatty acids like omega 3 and omega 6

Epidemiology of Psoriasis

(Feldman, 2016) There are varied studies on Psoriasis. A systematic review of international population-based studies found wide variation in the global prevalence of psoriasis. The prevalence of psoriasis in adults ranged from 0.91 to 8.5 percent, and the prevalence of the disease in children ranged from 0 to 2.1 percent. Disease prevalence tended to increase with increasing distance from the equator.

There is no clear gender predilection for psoriasis. Although psoriasis can begin at any age, the disease is less common in children than adults. There seem to be two peaks for the age of onset: one between the ages of 30 and 39 years and another between the ages of 50 and 60.

(Inderjeet Kaur, 1986) Psoriatic accounted for 1.4% of the total dermatology out-patients. There was a male preponderance. Three fourths of the patients had over 50% involvement of the skin surface. Severity of the disease was same in both sexes. Family history of psoriasis was present in 7.4 % the age of onset was significantly lower in them as compared to the patients without family history. Scalp was the first site of involvement followed by legs and arms. Nails, joints and mucosal involvement were seen in 62.2, 9.7 and 2.3% patients respectively. Pruritus was experienced by 63.5% patients.

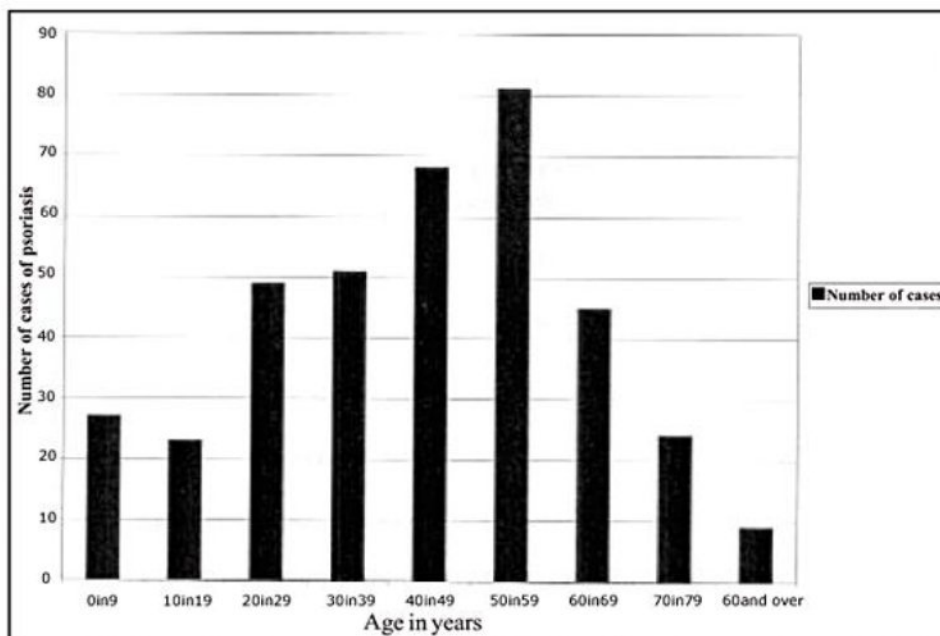
(Sunil Dogra, 2010) Prevalence of psoriasis varies in different parts of the world from 0% to 11.8%. In the USA, the prevalence of psoriasis was estimated to be around 4.6% while in Canada it was 4.7%. Data from Europe show little variation in countries with a range from 1.4% (Norway), 1.55% (Croatia) and 1.6% (UK). In East Africa, the figure was 0.7% and in the Henan district of China only 0.7% were found affected.

(Vinod Chandrana, 2010) In Europe the prevalence of psoriasis varies anywhere from 0.6 to 6.5%. In the USA, the estimated prevalence of diagnosed psoriasis is 3.15%. Psoriasis is less prevalent in China and Japan than in Europe, and is entirely absent in natives of the Andean region of South America.

(L, 2004) The prevalence of psoriasis is relatively high in the general population, ranging between 0.6% and 4.8%. Risk factors that have been documented in epidemiological studies include smoking, alcohol consumption, diet, infection, drugs, and stressful life events. Psoriasis affects the quality of life to substantial degree.

(R G B Langley, 2005) In the USA, approximately 2% of the population is affected with psoriasis. High rates of psoriasis have been reported in people of the Faroe Islands, where one study found 2.8% of the population to be affected. The prevalence of psoriasis is low in certain ethnic groups such as the Japanese, and may be absent in aboriginal Australians and Indians from South America. The mean age of onset for the first presentation of psoriasis can range from 15 to 20 years of age, with a second peak occurring at 55–60 years.

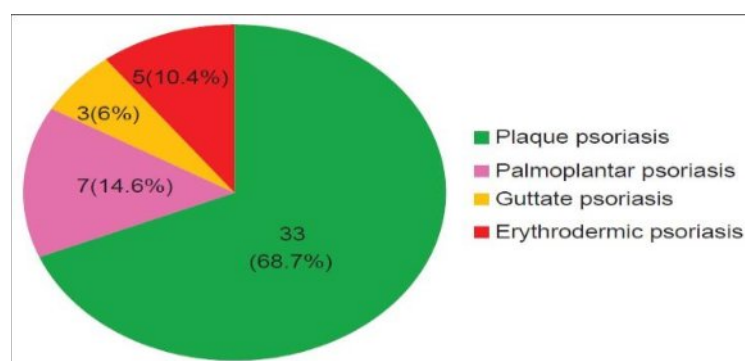
Presentation of Psoriasis by Age Group



Source : http://caribbean.scielo.org/scielo.php?pid=S0043314420060006000006&script=sci_arttext&lng=en

Graph 3

% of Different types of Psoriasis



Graph 4

Fact about Psoriasis

Occurrence of psoriasis varies by geographic location, and **increases as you get farther from the equator.**



Fututre of Anti Psoriasis

Anti psoriatic are the effective agents that are used to treat or relieves psoriasis.

(MARE'S MILK: A SOLUTION FOR PSORIASIS AND ECZEMA, 2012) New development represents that it may sound strange, but the use of mare's milk is most definitely advised for skin conditions such as psoriasis. Patient can just take a capsule containing the powdered extract of concentrated mare's milk and still get the same results.

IL-17 is a cytokine, which is a protein that controls cells and activates inflammation. Brodalumab (Amgen), secukinumab (Novartis) and ixekizumab (Eli Lilly) all work by interfering with the IL-17 pathway. Secukinumab and ixekizumab target IL-17, while brodalumab targets a specific receptor that binds to the IL-17 cytokine.

OTC and Prescription Drugs available for Psoriasis treatment

OTC drugs avilable for treatment of psoriasis :

- Corticosteroids slows the hyper generation of skin cells by suppressing the body immune system.
- Vitamin D slows the growth of skin cells to reduce the itching and pain of psoriasis.
- Anthralin normalizes DNA activity in skin cells to bring relief to the psoriasis sufferer
- Vitamin A cream slows skin cell growth and eases itching and pain. Retinol A Cream is an example of an OTC form of the cream, which is also used as an "anti-wrinkle" cream.
- Moisturizers help in slow scaling, improve dryness and lessen itching. Some common forms of moisturizers include Vaseline and Aquaphor.
- Salicylic acid is available in OTC form as a 2% to 10 % solution in Petrolatum. Skin Therapy.com warns too much of the drug can be toxic and should not be applied to large areas of skin.

Atopic Dermatitis

INTRODUCTION

In 1925, Coca introduced the concept of atopy, meaning out of place or strange. In 1933, the concept of atopic dermatitis was introduced, emphasizing the cutaneous manifestation of atopic diathesis. Atopic dermatitis also called as atopic eczema, infantile eczema, flexural eczema.

Dermatitis generally begins in childhood, but varying manifestation often persist into adulthood. A child is at increased risk if either parent is affected. The rate rises to 79% if both parents are atopic.

Criteria for atopic Dermatitis

Major Criteria

It must have three of the following :

1. Pruritus
2. Typical morphology and distribution
 - Flexural lichenification in adults
 - Facial and extensor involvement in infancy
3. Chronic or chronically relapsing dermatitis
4. Personal or family history of atopic disease.

Minor Criteria

1. Xerosis
2. Itchyosis
3. IgE reactivity
4. Elevated serum IgE
5. Early age of onset
6. Nipple eczema
7. Cheilitis
8. Food hypersensitivity
9. Itch when sweating
10. Keratoconus
11. Facial erythema
12. Perifollicular accentuation
13. White demographism
14. Cutaneous infection.
15. Conjunctivitis
16. Infraorbital fold
17. Pityriasis alba
18. Itch when sweating
19. Intolerance to wool and lipid solvents
20. Food hypersensitivity
21. White demographism
22. Course influenced by environmental / emotional factor

Criteria for children with atopic dermatitis

Essential features

1. Pruritus
2. Eczema
 - Typical morphology and age specific pattern
 - Chronic history

Important Features

1. Early age at onset
2. Atopy
3. Personal / family history
4. IgE reactivity
5. Xerosis

Associated Features

1. Atypical vascular responses
2. Keratosis pilaris / ichthyosis
3. Orbital/ periorbital changes
4. Other regional findings
5. Perifollicular accentuation

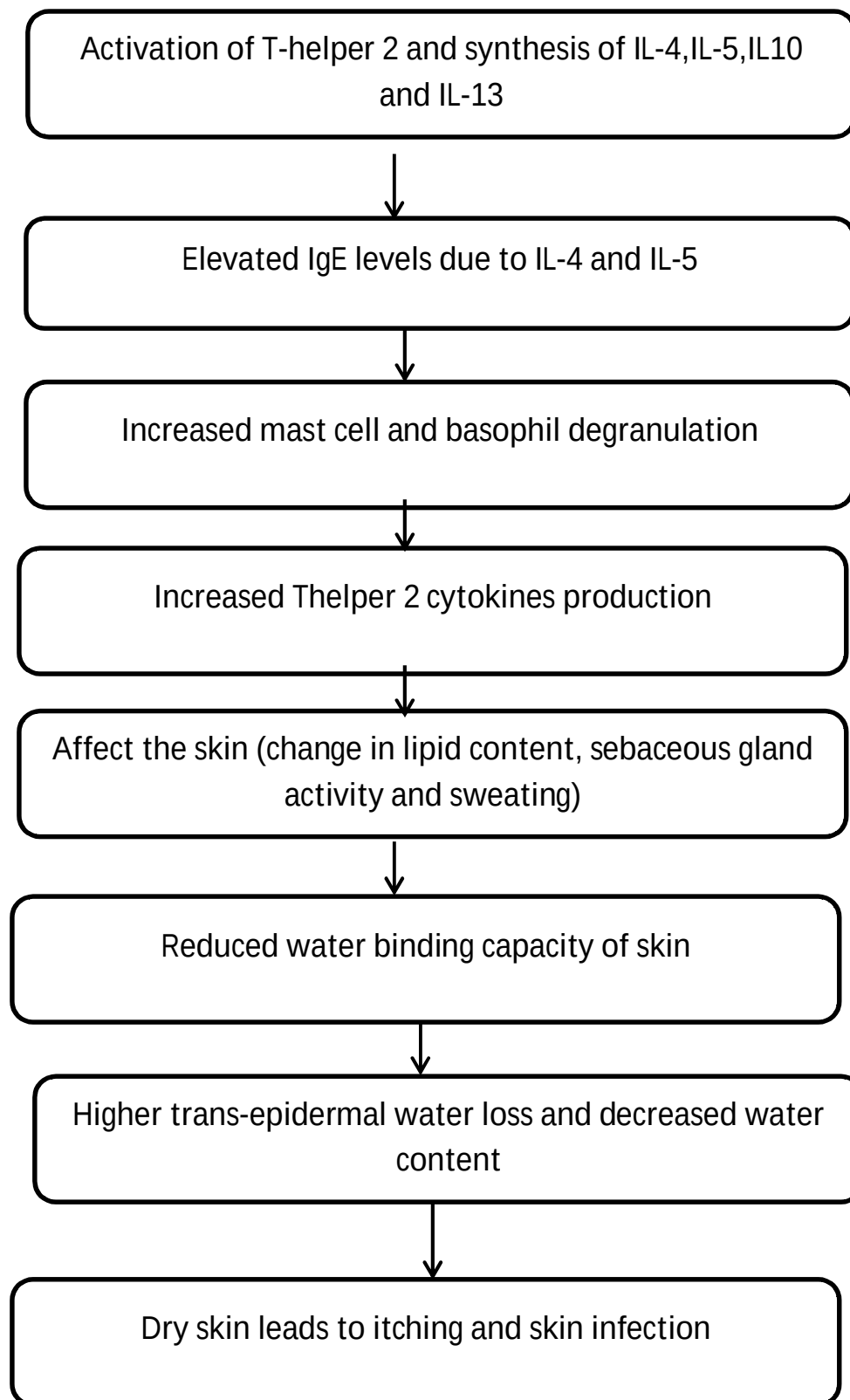
Types of Atopic Dermatitis

- Infantile Atopic Dermatitis - Eczema in infancy usually begins as erythema and scaling of the cheeks. The eruption may extend to the scalp, neck, forehead. Lesions may be papular or exudative.

Worsening of atopic dermatitis is observed after immunization and viral infection. Food allergy in infantile and childhood atopic dermatitis remain controversial.

- Childhood Atopic Dermatitis- The classic locations are wrist, eyelid, face and around the neck. These are intermingled with isolated papules. Pruritus is constant feature and most cutaneous changes are secondary to it. Severe atopic dermatitis involves more than 50% of the body surface area is associated with growth retardation.
- Atopic dermatitis in Adolescents and Adults – In older patients it may occur as localized erythematous, scaly papular exudative plaques. Distribution is generally less characteristic, and chronic hand eczema may predominate. Itching often occurs in response to heat and stress.

Pathophysiology



Treatment

There is no known cure for atopic dermatitis (eczema). As a large part of the tendency towards eczema is genetic. Several treatments are available that will control the eczema so the skin looks and feels normal.

- The treatment chosen by the doctor depends on the, severity and duration of eczema.
- The trigger factors for eczema should be avoided.
- In general topical treatments are used first as they are effective for most patients

Topical treatments for atopic dermatitis

Most people with eczema use topical treatments (lotions, creams and ointments) to lessen irritation.

Emollients

They provide moisture to the skin and help in preventing water loss. Emollients are a very important part of eczema management, even (especially) when the eczema is well controlled.

- Dry skin always accompanies atopic dermatitis. Emollients can lessen stinging and itching, reduce the number of flares and infections, and improve the appearance.
- Creams are most commonly used. Lotions are easy to apply but evaporate quickly and may not be oily enough. Ointments are more effective than creams in very dry skin but are unappealing because they are hard to rub and leave a greasy surface. Ointments can also encourage folliculitis.
- Emollients should be used at least twice a day all over the skin. They are best applied within three minutes after a shower or bath to maximize their moisture-retaining effect.
- Cleansers are best used in place of soap or detergent for cleansing dry skin. Bath additives may include (unfunded) colloidal oatmeal, and bath oils (these make bath surfaces slippery).
- FDA-approved products composed of ceramides, cholesterol and fatty acids aim to mimic the lipids naturally found in the horny layer of the skin and may reduce the need for anti-inflammatory medications.

Topical steroids

Topical steroids are used in treatment for mild to moderate eczema. They are also used in severe atopic dermatitis to reduce the dose of oral treatments and ultraviolet light. They are very effective and safe, used correctly. The trick is to use the correct strength of steroid for the severity of the eczema and be prepared to change treatment as the severity of the eczema changes.

- The thickness of skin varies in different areas of the body. The thinnest skin is found on the face (particularly the eyelids), genitals, body folds and the skin of infants. These areas absorb topical steroids very readily and are more prone to local side effects from them.
- Systemic absorption and adrenal suppression is only a concern if large amounts of potent topical steroids (e.g. more than 100g/week) are used over a long period of time (months).
- Topical steroids can further reduce the skin barrier function so are best applied as intermittent courses so it can recover.
- In general, the lowest strength and smallest quantity of topical steroid that is effective should be used, applied to all areas affected. There is no benefit from applying them more than once daily; use an emollient if the skin is dry or irritable.
- Mild eczema is likely to respond to low potency topical steroids within a few days, often with complete clearance of eczema within one or two weeks. Moderate eczema may require more potent topical steroids for at least two weeks before improving and may require several weeks of treatment before clearing. Severe eczema may show only partial improvement with potent topical steroids alone even after several months of use.
- It is important to use the treatment as directed for best results and to avoid side effects. One of the most common reasons topical steroids are ineffective is that they are not used enough.

As eczema tends to be persistent, most people will have to use topical steroids on and off for many years. If used continuously topical steroids may lose their effectiveness after a few weeks (this is known as tachyphylaxis). Tachyphylaxis can be avoided by reducing the strength and frequency of the topical steroid as the eczema comes under control.

- Intermittent treatment works very well for mild eczema, which responds within a week or two to relatively weak topical steroids and can often be maintained with emollients alone. If it flares, the same topical steroid can be used again with good effect.
- Moderate and severe eczema are more difficult to manage. The eczema may not have completely cleared with a potent topical steroid after three to four weeks. This can be managed by gradually reducing the number of days the stronger topical steroid is used, for example using a potent topical steroid at weekends and an emollient on weekdays.
- If tachyphylaxis occurs, treatment needs to be tailored to the individual patient. Changing to a different topical steroid of the same strength can be helpful. Treatment of infection, if present, may again make the topical steroid effective. A stronger topical steroid or an additional treatment such as phototherapy may be required.

Topical immunomodulators

The topical immunomodulators or calcineurin inhibitors pimecrolimus cream (Elidel™) and tacrolimus ointment (Protopic™, which is not yet available in New Zealand) are particularly useful for mild to moderate atopic dermatitis. They are antiinflammatory but do not thin the skin or affect its barrier function.

Topical pimecrolimus is most effective when used at the earliest sign of eczema (such as redness or itching) to prevent flares.

- Topical tacrolimus is more potent and may have greater immunosuppressive activity.
- Short courses of topical steroids are more suitable for flares.
- The main side effect is initial burning, feeling of warmth or itching.
- Topical immunomodulators are particularly useful for eczema in thin-skinned areas (face, genitals and body folds).

Antiseptic solutions

Antiseptic solutions can also be helpful in infected eczema as long as the concentration is not too high or they can have an irritant effect on the skin. Apply an emollient as well.

- Bleach bath: add half a cup of household bleach (6% sodium hypochlorite solution) to a full bath and soak for 10 minutes.
- Condy's crystals (potassium permanganate) are used in weak concentration in the bath (just enough to make the water a light rose pink colour).
- Other antiseptics include cetrimide, chlorhexidine, chloroxylenol, dibromopropamide, polynoxylin, povidone iodine and triclosan.

Tar preparations

Coal tar, pine tar and ichthammol preparations are available as creams, bandages and bath additives. Although reducing itch and inflammation, they can be smelly and messy and do not appear as effective as topical steroids.

Wet wraps

'Wet wraps' are wet bandages applied over emollients +/- topical steroids. Tubular elastic bandages are convenient. Wet wraps are used in acute red, hot, weeping eczema and usually require admission to hospital. They can quite quickly gain control of eczema and appear to work by cooling and moisturising the skin. They also protect the skin from damage due to scratching. They can be repeated for several days or longer, reapplied as they dry out.

Antibiotics in the treatment of atopic dermatitis

- Antibiotics are sometimes very important in the management of atopic dermatitis, most often when there are signs of bacterial infection such as weeping, crusting, pustules or painful swelling (cellulitis). The antibiotics are mostly given orally, but sometimes hospital admission is necessary for intravenous treatment.
- In New Zealand, the penicillin derivatives flucloxacillin or dicloxacillin are usually prescribed, or erythromycin in those allergic to penicillin. Another drug active against staphylococcus and streptococcus may be preferred.
- On discontinuing the oral antibiotic, the patient may suffer another flare. If this occurs repeatedly, antibiotics may be prescribed for several weeks or months. There is a low risk of side effects from such treatment. The main concern is the development of bacterial resistance to antibiotics (MRSA).
- Antibiotic creams and ointments are not recommended for use in extensive atopic dermatitis. They are not as effective as oral antibiotics. They may also cause contact allergic dermatitis or promote the development of bacterial resistance to antibiotics.

Oral antihistamines in the treatment of atopic dermatitis

- Antihistamines are sometimes helpful in stabilising atopic dermatitis and may reduce the itch. This is more likely if the patient has dermographism or other forms of urticaria.
- They tend to be used more commonly in children. The sedating antihistamines allow a better night's sleep for the child and his or her parents.
- A trial of a non-sedating antihistamine such as cetirizine for several months may be helpful and may have disease-modifying effects in adults and children.

Phototherapy for atopic dermatitis

- Phototherapy or ultraviolet (UV) treatment is reserved for severe eczema as it is expensive, time-consuming and has potential side effects. It involves controlled exposure to [UV-B](#) and/or UV-A for a few minutes two to three times each week. A treatment course may continue for several months.
- More severe cases may require photochemotherapy ([PUVA](#)) or, where available, UVA1.
- Topical treatments are usually continued. Additional emollients may be necessary as phototherapy may aggravate dryness.
- Phototherapy is unsuitable for those who have little flexibility with work or school hours, mobility or transport problems, very fair skin or a history of photosensitivity. It is also unsuitable for very young children as they are unable to stand still for the required period of time and cannot be relied upon to wear safety glasses.

Systemic treatments for atopic dermatitis

The following oral medications are reserved for severe eczema, usually after a trial of phototherapy has at least been considered.

- The oral corticosteroids prednisone and prednisolone are often used in the short-term management of severe eczema. Oral corticosteroids gain rapid control of the eczema but they cannot be continued for more than a few weeks at a time without significant side effects.

- If an ongoing oral medication is required a non-steroidal immunosuppressant agent such as azathioprine, methotrexate, ciclosporin or mycophenolate may be used to enable the dose of steroid to be reduced and eventually discontinued.

Despite the potential long-term side effects of immunosuppressive agents, most patients who take them for severe eczema are very happy with the result as it frees them from otherwise disabling eczema. Immunosuppressant agents are not intended for indefinite use but if severe eczema relapses every time they are stopped they may be needed at least intermittently for many years.

In the future, it is anticipated that biologic medications will be developed for atopic dermatitis. A monoclonal antibody that targets Th2 cytokines interleukin (IL)-4 and IL-13, dupilumab, is showing promise in clinical trials for the treatment of atopic dermatitis. Other biologic agents are under investigation.

Behavioral therapy for atopic dermatitis

Scratching damages the skin, aggravating the eczema, which then itches even more. Some scratching is just a bad habit or stress reaction. Behavioural therapy can be helpful to develop strategies to reduce scratching (habit reversal) thus leading to improvement in the eczema.

Lifestyle changes to treat atopic dermatitis

- Take an oral allergy or anti-itch medication.
- Take a bleach bath
- Apply an anti-itch cream or calamine lotion to the affected area.
- Moisturize your skin at least twice a day.
- Avoid scratching
- Apply cool, wet compresses.
- Take a warm bath.
- Choose mild soaps without dyes or perfumes.
- Use a humidifier
- Wear cool, smooth-textured cotton clothing.
- Treat stress and anxiety.

Epidemiology:

(S., 2015) The prevalence of AD is estimated to be 15-20% in children and 1-3% in adults, and the incidence has increased by 2- to 3-fold during the past decades in industrialized countries. For the age group 6-7 years, data showed that the prevalence of AD ranged from 0.9% in India to 22.5% in Ecuador, with new data showing high values in Asia and Latin America. For the age group 13-14 years, data showed prevalence values ranging from 0.2% in China to 24.6% in Columbia. Prevalence over 15% was found in 4 of 9 regions studied including Africa, Latin America, and Europe. AD seems to have reached a plateau in the countries with the highest prevalence such as the UK and New Zealand, AD continues to increase in prevalence, specifically in young children (age 6-7 as compared to age 13-14 years) and in low-income countries, such as Latin America or South East Asia which have emerged as regions of a relatively high prevalence in the follow-up data.

(SP, 2012) Atopic dermatitis (AD) is a common skin condition with significant associated social and financial burden. AD affects adults and children with worldwide prevalence rates of 1-20%. International study of epidemiology and geographic variability in prevalence of AD had been conducted in three phases with 1,000,000 subjects in the third phase study. The prevalence of AD seem to had reached a plateau around 20% in countries with the highest prevalence, suggesting that AD may not be on a continued rise but that a finite number of individuals may be

susceptible to the condition. Risk factors associated with increased prevalence include higher socioeconomic status, higher level of family education, smaller family size and urban environment.

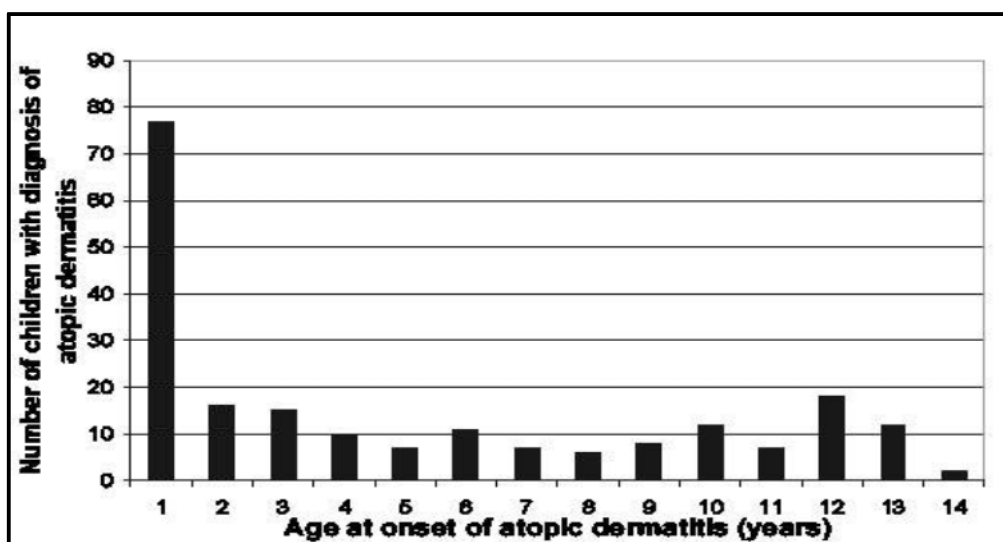
(Kapur, 2011) The prevalence of AD had increased over the past 30 years. It was estimated that 10-20% of children and 1-3% of adults in developed countries are affected by the disorder. AD often starts in early infancy approximately 45% of all cases begin within the first 6 months of life, 60% during the first year, and 85% before 5 years of age. Up to 70% of these children outgrow the disorder before adolescence, Children with AD are at high risk of developing asthma and allergic rhinitis. Of those who develop AD before the age of 2, 50% will develop asthma during subsequent years.

(Sorna Kumar, 2014) Research was conducted in one medical college each in four zones of India. The point prevalence of dermatological cases was 9.25%. The point prevalence of AD were 6.75%. AD was most prevalent in the first decade (40.7%). Personal history of atopy was present in (59.5%) patients. Dry skin was present in 92.5% of patients.

(Todd, 2014) Studies address the prevalence of AD in South African populations. The Phase One ISAAC study of 13 - 14-year-old schoolchildren in Cape Town showed an 8.3% one-year prevalence rate of AD symptoms, with 2.3% having severe disease. The Phase Three follow-up study documented an increased one-year prevalence of 13.3% among children of the same age. No children 6 - 7 years of age were included for SA in either study. In normal 3 - 11-year-olds, the one-year prevalence rate was 1 - 2.5% in children, depending on the methodology used to define AD and whether they came from urban or rural environments.

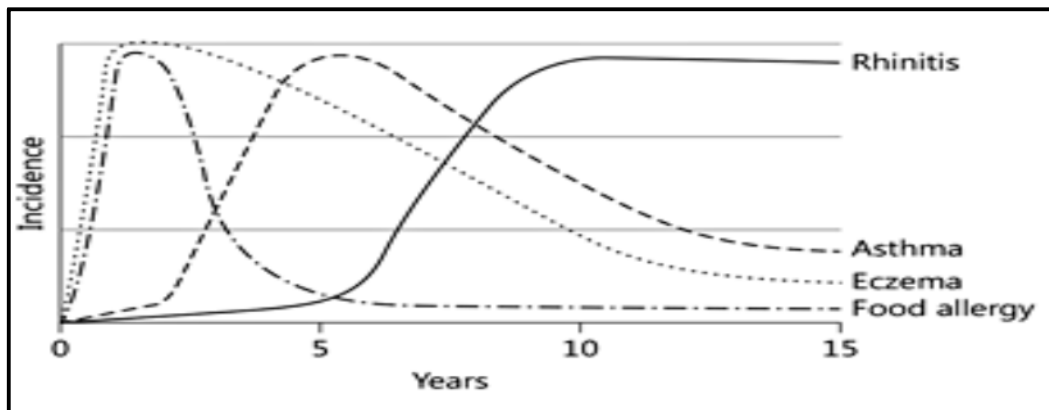
(Virendra N Sehgal, 2015) 100 fresh patients of atopic dermatitis, diagnosed on the basis of an established three or more major and minor criteria. Serum immunoglobulin E (IgE) levels were determined by conventional technique. Its overall prevalence was 0.98%, while that of new patients was 0.24%. 83% were in the age group of 2-12 years, of which 83.1% were males and 16.9% were female, of which 70% had urban, while 30% had rural background. Its duration varied from 8 to 192 weeks, with a mean of 76 weeks, and a standard deviation of 21.42 weeks.

Distribution of 208 children with atopic dermatitis according to age at diagnosis



Graph 5

Incidence of different types of atopy by age



OTC and Prescription Drugs available for Atopic Dermatitis

OTC drugs available for treatment of atopic dermatitis :

- Bath Oils : Mineral or vegetable oil plus surfactants
 - a) Mineral oil products are absorbed better than vegetable oil products.
 - b) Some products are combined with colloidal oatmeal: better relief of itching.
 - c) Minimally effective in improving dry skin disorder d/t dilution in the water.
 - d) Major effect: slip or lubricity they impart to the skin.
- Cleanser : Glycerin soaps, Mild cleansers: Cetaphil
 - a) Typical bath soaps remove many substances from the skin including lipids that normally keep the skin soft.
 - b) Glycerin soaps: higher oil content than standard soaps the addition of castor oil - closer to neutral pH .
- Emollients and moisturizers : Face and Body Moisturizers
 - a) Either oil-in-water or water-in-oil emulsions.
 - b) Hand ointments: petroleum jelly

Emollients

- a) Fill the spaces between desquamating skin scales temporarily, leaving an oily film on skin surface that moisture cannot readily escape.
- b) Occlusive agents and moisturizers that are used to prevent or relieve the signs and symptoms of dry skin.
- c) Act primarily by leaving an oily film on the skin surface through which moisture cannot readily escape.
- Humectants : Glycerine, Propylene glycol, Phospholipids

PRESCRIPTION drugs available for treatment of atopic dermatitis :

- Topical Corticosteroids are the common and effective treatment for atopic dermatitis.
- Calcineurin inhibitors are topical immunosuppressant's medicines that weaken body's immune system and have potential of causing cancer risk.
- Antihistamines are often used to treat atopic dermatitis itch.

- Oral corticosteroids are used in severe cases when the rash covers large areas of the body or when complications occur.
- Cyclosporine or interferon is sometimes used in adults if other treatment doesn't help.
- Antibiotic, antiviral, or antifungal medicines are used if the rash gets infected. Skin that has been broken down by scratching and inflammation can become infected.
- Coal tar applied to the skin may help reduce itching. But this medicine should not be used on skin that is very irritated, because it can make your skin problem worse.

Lichen Simplex Chronicus

INTRODUCTION

Long continued rubbing and scratching vigorously than a normal pain threshold makes skin thick and leathery. The normal markings of skin becomes exaggerated forming criss-cross pattern and late mosaic is produced. This process or change is called Lichenification. Paroxysmal is the main symptom and it is known as lichen simplex chronicus.

It is mainly seen at the back and sides of the neck, wrists and ankle.

Several Types are recognized-

- Lichen simplex nuchae occurs at the back of the neck, excoriated and bleeding.
- Nodular neurodermatitis consist of multiple pruritic and excoriated papules . The nodules or papules may ooze and form crust and scales.
- Persistent rubbing result in dermal deposit of amyloid and development of lichens and macular amyloidosis.

Conditions that can lead to lichen simplex chronicus include:

- Insect bites
- Scars
- Eczema (atopic dermatitis)
- Dry skin (xerosis)
- Poor circulation in legs (venous insufficiency)
- Anxiety and stress

Treatments :

Medication by Physician:

- Numbing the skin with injectable anaesthetics.
- Sampling a small piece of skin by using a flexible razor blade, a scalpel, or a tiny cookie cutter .If a punch biopsy is taken, a suture or two may be placed and will need to be removed 6–14 days later.
- Aggressive moisturizing techniques
- Corticosteroid creams or ointments
- Creams containing salicylic acid or urea, to improve penetration of the topical corticosteroid
- Oral anti-histamines, especially for use at bedtime
- Injection of corticosteroid solution directly into the lichen simplex chronicus lesions
- Ultraviolet light therapy
- Sedatives or anti-depressants for people with lichen simplex chronicus strongly related to psychological stress
- Doxepin or capsaicin cream
- Antibiotics

Lifestyle changes to treat Lichens simplex chronicus

- The primary treatment is to stop scratching. Areas of lichen simplex chronicus may need to be covered
- Manage stress and behavior modification.

- Use moisturizers to relieve itchy skin. Choose oil-based creams and ointments that work better than water-based lotions. Apply moisturizers just after bathing, while the skin is still moist.
- Apply over-the-counter hydrocortisone cream to decrease the itch. If there are breaks or cracks in the skin, apply an antibiotic ointment to prevent infection.
- Use soap and coal tar containing lotions.

Varicose Eczema

INTRODUCTION

Venous eczema is a common form of eczema / dermatitis that affects one or both lower legs in association with venous insufficiency. It is also called gravitational dermatitis, venous eczema and stasis eczema.

Venous eczema is most often seen in middle-aged and elderly patients—it is reported to affect 20% of those over 70 years. It is associated with:

- History of deep venous thrombosis in affected limb.
- History of cellulitis in affected limb.
- Chronic swelling of lower leg, aggravated by hot weather and prolonged standing
- Varicose veins
- Venous leg ulcers

Signs and Symptoms

The affected skin becomes:

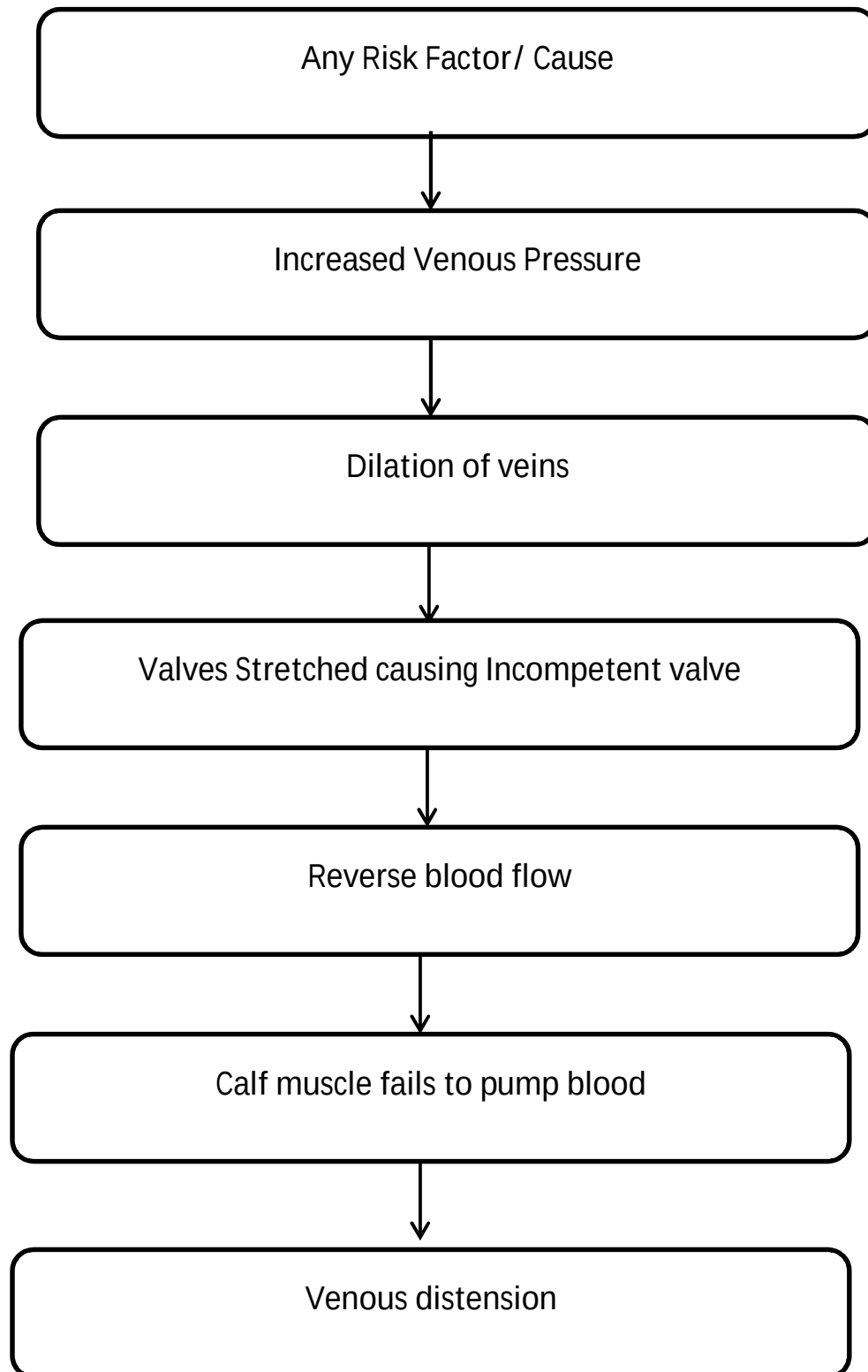
- Itchy
- Red and swollen
- Dry and flaky
- Scaly or crusty
- Varicose veins are often visible on the legs.
- Brown discolouration of the skin
- Red, tender and tight skin that becomes hardened
- Small, white scars
- Pain
- Eczema affecting other parts of the body.

Risk Factor

- Genetics
- Age
- Gender
- Pregnancy
- Overweight



Figure 6



Treatment

Treatment for varicose eczema aims to improve the condition of skin and helps in circulation (blood flow).

Treatment options may include

- Emollients (moisturisers)

- Topical corticosteroids
- There are some self-help techniques. Varicose veins can be treated by graduated elastic medical compression stockings. However, in some cases, surgery may be necessary.
- Lipodermatosclerosis (hardened, tight skin) is treated the same way as varicose eczema.

Self Help Treatment

There are some steps that can be taken for treating varicose eczema :

- Avoid skin injury - for example, by knocking into a chair because this could lead to an ulcer (open sore) development.
- Raising legs when resting - for example, by propping up feet on some pillows, for reduce swelling.
- Keep physically active, because this will improve your circulation and enable you to maintain a healthy weight.
- Avoid standing still for long periods of time. (In this position there is more pressure on the veins in the legs. The muscles are not squeezing the veins, as they do when you are walking.)
- Prevent skin from becoming too dry by applying regular moisturising creams.

Emollients

- Emollients are substances that help to soften and smooth your skin to keep it supple and moist. They are one of the most important forms of treatment for all types of eczema.
- As varicose eczema can cause your skin to become dry and cracked, it is important to keep it moisturised to prevent further irritation. Emollients prevent water being lost from the outer layer of skin (epidermis), as well as adding water to the skin. They act as a protective barrier to keep moisture in and irritants out.
- The difference between lotions, creams and ointments is the amount of oil that they contain. Ointments contain the most oil so they can be quite greasy, but are the most effective at keeping moisture in the skin. Lotions contain the least amount of oil so are not greasy, but can be less effective. Creams are somewhere in between.

The most common side effect of using emollients is a rash.

Topical corticosteroids

Skin is red and inflamed from a flare-up of varicose eczema, corticosteroid helps in reducing inflammation

Different strength topical corticosteroids are prescribed depending on the severity of varicose eczema. If you have flare-ups of Lipodermatosclerosis, you may need a very strong topical corticosteroid. Therefore you may be prescribed a cream or an ointment.

If your varicose eczema is moderate to severe, you may need to apply topical corticosteroids between flare-ups and during them.

If you need to use corticosteroids frequently, visit your GP regularly so they can check that the treatment is working.

Graduated elastic medical compression stockings

Medical compression stockings are designed to steadily squeeze legs for improving blood circulation. They are often tightest at the ankle and loose from above. This helps blood to flow upwards towards heart. Medical compression

stockings are used to treat varicose eczema and Lipodermatosclerosis. They improve the condition of the skin by reducing the high blood pressure in the veins in the leg.

Compression stockings are available in a variety of different sizes and pressures. Most people with varicose eczema will be prescribed a class 1 (light compression) or class 2 (medium compression) stocking. They are also available in

- different colours
- different lengths – some come up to the knee and others also cover the thigh
- different foot styles – some cover the whole foot and some stop before the toes.

Nail Disorders

INTRODUCTION

Nail abnormalities are common. Appearances may be difficult to diagnose with certainty, and care must be taken to ensure correct diagnosis and therefore treatment.

Some of the causes of nail disorders include the following:

- Infections such as paronychia Acute Paronychia, wart, and green nail syndrome.
- Injuries
- Internal diseases
- Structural problems such as an ingrown toenail.
- Birth deformities
- Drugs
- Tumours

Spotlight on aging

With aging nail become brittle and dry and flat or concave instead of convex. They may also develop ridges along the length. Brittle nails splits and colour change from yellow to grey.

Toe nails requires special attention in older people and diabetic patients. They have sensation in their feet that increase the risk of injury when trimmed.



Figure 7

Some common nail disorders are :

1. In growing toe nail

- A common problem resulting from various causes – e.g., improperly trimmed nails, hyperhidrosis and poorly fitting shoes.
- It often presents with pain but may progress to infection and difficulty with walking.
- Treatment options include cutting nails square, hot water soaks, antibiotics or excision and wedge excision or total excision of nail. A Cochrane review found that surgical treatments were more effective than non-surgical treatments.^[2]

2. Beau's lines- Transverse ridges are usually transient and due to a temporary disturbance of nail growth - e.g., severe illness.

3. Green nails- These are caused by pseudomonal infection.
4. Blue nails - They may occur as a side-effect of anti-malarial drugs.
5. Black nails
 - These may be a feature of Peutz-Jeghers syndrome, vitamin B12 deficiency and post-irradiation.
 - Black streaks may indicate a junctional melanocytic naevus or malignant melanoma.
6. Leukonychia (white nail)
 - This may be congenital or due to minor trauma, hypoalbuminaemia in chronic liver disease, renal failure, fungal infection or lymphoma.
7. Yellow nail syndrome
 - Yellow nail syndrome is characterised by slow-growing, excessively curved and thickened yellow nails which are associated with peripheral lymphoedema and exudative pleural effusions.
8. Clubbing
 - An increase in the soft tissue of the distal part of the fingers or toes, common causes of finger clubbing include
 -
 - Cyanotic congenital heart disease, infective endocarditis.
 - Lung cancer, pulmonary fibrosis, cystic fibrosis, bronchiectasis, empyema, lung abscess.
9. Koilonychia
 - Dystrophy of the fingernails in which they are thinned and concave with raised edges (spoon-shaped nails).
 - May be due to iron deficiency or trauma.
10. Onycholysis
 - The nail becomes detached from its bed at the base and side, creating a space under the nail that accumulates dirt. Air under the nail may cause a grey-white colour but can vary from yellow to brown.
 - In psoriasis can see a yellowish-brown margin between the margin between the normal nail (pink) and the detached parts (white).
 - If *Pseudomonas aeruginosa* grows underneath the nail, then green colour.
 - When nail bed separation begins in the middle of the nail then appearance resembles an 'oil spot' or 'salmon-patch'.
 - Causes of onycholysis include:
 - Idiopathic or inherited
 - Systemic disease - eg, thyrotoxicosis
 - Skin disease - eg, psoriasis
 - Local causes - eg, trauma or chemicals

11. Onychogryphosis

- Thickening of the nail plate is mainly seen on big toes of the elderly, associated with injury to the foot, badly fitting shoes or poor blood supply.
- Central grooves in the centre of the nail. Also, the cuticle is pushed back and inflamed.
- Most commonly results from the compulsive habit of a patient picking at a proximal nail fold thumb with an index fingernail.
- Disappears if patient stops the habit.

Treatment

1. Antifungal tablets

Oral medication containing terbinafine or itraconazole helps in treating nail fungus and enables, healthy nail to grow.

2. Antifungal Nail Paint

Applying prescription topical brittle nail solution, that protect nail surface

3. Surgery and Laser treatment

- Surgery for removing damaged nail for enabling new nails to grow back.
- For stubborn toe nail infection, laser therapy involves high dose of light energy that kills and destroy fungus.

Lifestyle changes to treat nail disorder

- Minimum exposure to water.
- Using nail moisturiser to lock
- Soaking nails in warm olive oil, coconut oil
- Keeping trimming and thinning of nails
- Applying vick vapo-rub with cotton swab
- Natural treatment involves soking nails in apple cider vinegar,Oile leaf extarct, tea tree oil , orange oil, Corn meal.
- Baking soda and sodium borate has a great fungicidal properties
- Coconut oil can be applied to the skin and has antifungal properties.

Pemphigus Vulgaris

INTRODUCTION

Pemphigus, a word derived from the Greek word “pemphix” meaning bubble or blister, is a lifethreatening autoimmune blistering disease characterized by intraepithelial blister formation. Pemphigus vulgaris is an autoimmune, intraepithelial, blistering disease affecting the skin and mucous membranes. It is mediated by circulating autoantibodies directed against keratinocyte cell surfaces. It is a chronic blistering skin disease with skin lesions that are rarely pruritic, but which are often painful.

The blisters have thin roofs and break easily to leave raw areas (erosions) that can be extensive and painful. Pemphigus does not go away by itself, and always needs treatment by a specialist.



Types of Pemphigus

1. Genetic Blistering Disease :
 - a. Epeidermolysis bullosa
 - b. Hailey-Hailey disease
2. Immunobullous Disease :
 1. Intraepidermal Immunobullous Disease :
 - Pemphigus Vulgaris
 - Pemphigus Vegetans
 - Pemphigus Follicious
 - Induced P
 - Inter cellular IgA dermatosis & SCPD
 - Paraneoplastic P
 2. Subepidermal Immunobullous Disease :
 - Bullous pemphigoid
 - Mucous Membrane Pemphigoid
 - Pemphigoid Gestations
 - Linear IgA disease
 - Epidermolysis Bullosa Acquisita
 - Bullous SLE
 - Dermatitis Herpetiformis

1) Epidermolysis Bullosa – It is a group of inherited connective tissue diseases that cause blisters in the skin and mucosal membranes, with an incidence of 20 per million new born in the United States. It is a result of a defect in anchoring between the epidermis and dermis, resulting in friction and skin fragility. Its severity ranges from mild to lethal.

2) Hailey-Hailey disease - It is a rare genetic disorder that is characterized by blisters and erosions most often affecting the neck, armpits, skin folds and genitals. The lesions may come and go and usually heal without scarring. Sunlight, heat, sweating and friction often aggravate the disorder. The symptoms of Hailey-Hailey disease occur because of the failure of skin cells to stick together resulting in the breakdown of affected skin layers. Hailey-Hailey disease occurs due to a mutation in a specific gene that creates a protein that is essential for the proper health of skin.

3) Immunobullous Disease - The immunobullous diseases are a group of autoimmune blistering disorders of the skin and mucous membranes that share the common features of autoantibody deposition and blister formation at the dermal-epidermal junction or basement membrane.

4) Subepidermal Immunobullous Disease - The sub epidermal immunobullous diseases are a group of autoimmune blistering disorders of the skin and mucous membranes that share the common features of autoantibody deposition and blister formation at the dermal-epidermal junction or basement membrane. This group includes bullous pemphigoid, linear IgA disease, dermatitis herpetiformis, and epidermolysis bullosa acquisita, among others. Although these disorders share some common features, each disease is unique in its clinical presentation, histopathology, and immunofluorescence patterns, which allows for accurate diagnosis and disease-specific treatment strategy. Treatment of these disorders is complex and requires expert knowledge of disease pathogenesis.

Signs and Symptoms:

Most patients first present with lesions on the mucous membranes such as the mouth and genitals. Several months' later blisters on the skin may develop or in some cases mucosal lesions are the only manifestation of the disease, 50-70% of patients get oral lesions. The most common mucosal area affected is the inside of the mouth but others include the conjunctiva, oesophagus, labia, vagina, cervix, penis, urethra and anus.

- Painful blisters that start in the mouth or skin areas. Blisters in the mouth often turn into painful sores, which can make eating, drinking and brushing teeth very difficult. The voice can become hoarse if they spread to the voice box (larynx).
- Skin blisters near the surface of the skin that comes and goes. There tends to be times when the blisters are severe (flare-ups), followed by periods when they heal and fade (remission). It's impossible to predict when this might happen and how severe the flare-ups will be.
- Oozing, crusting, or peeling at the blister site. Sores on the skin can join together to form large areas of painful, raw-looking skin, before crusting over and forming scabs. They don't usually leave any scars, although affected skin can occasionally become permanently discoloured.

Different parts of body represents different sign and symptoms :

a. Mucous membranes

- Mucous membranes of the oral cavity are involved in almost all patients with pemphigus vulgaris.
- Patients may have ill-defined, irregularly shaped, gingival, buccal, or palatine erosions, which are painful and slow to heal.
- Erosions may be seen on any part of the oral cavity, and they may spread to involve the larynx, with subsequent hoarseness.
- In juvenile pemphigus vulgaris, stomatitis is the presenting complaint in more than 50% of cases.
- Other mucosal surfaces may be involved, including the conjunctiva, esophagus (causes odynophagia and/or dysphagia), labia, vagina, cervix, vulva, penis, urethra, nasal mucosa, and anus.

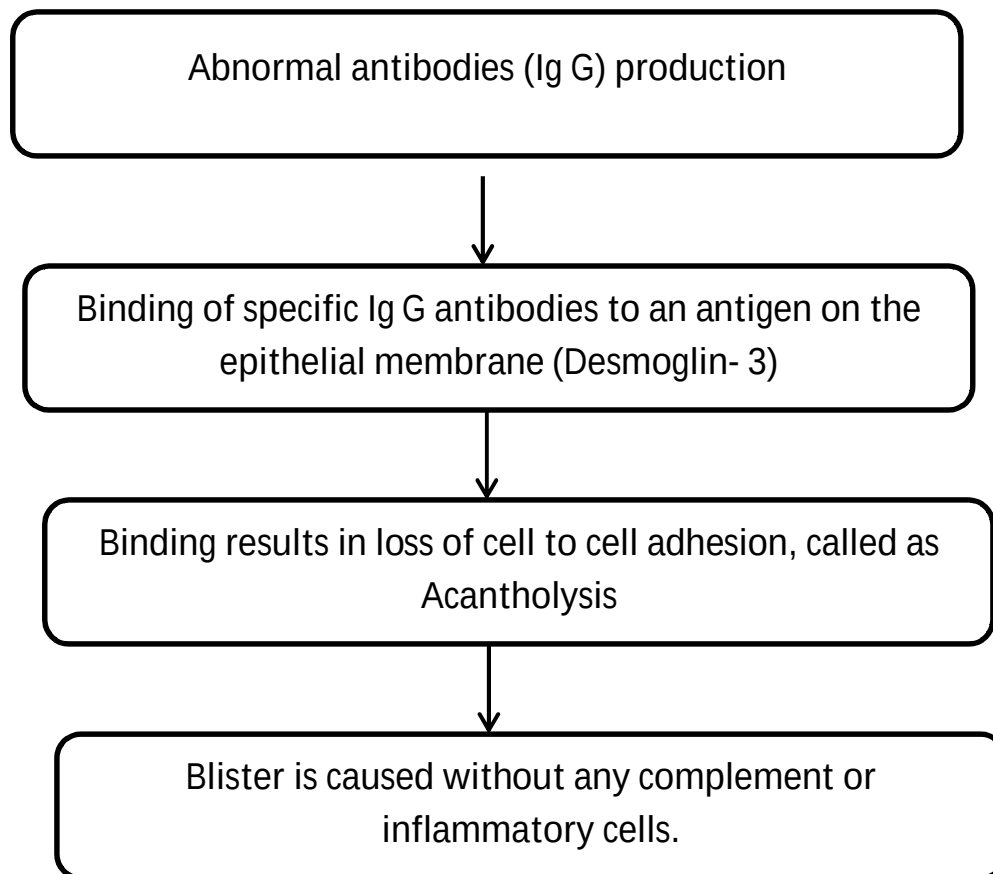
b. Skin

- Primary lesion of pemphigus vulgaris is a flaccid blister filled with clear fluid that arises on healthy skin or on an erythematous base.
- Blisters are fragile and may rupture, producing painful erosions (the most common skin presentation).

c. Nails

- Acute or chronic paronychia, subungual hematomas, and nail dystrophies affecting one or several fingers or toes have been reported with pemphigus vulgaris.

Pathophysiology



Diagnosis

Pemphigus Vulgaris is rare and not easily diagnosed by general practitioners, thus it is diagnosed mostly by dermatologist or another medicinal specialist.

- The skin separates easily when the surface of unaffected skin is rubbed sideways with a cotton swab or finger. This condition is called a positive Nikolsky's sign. It is diagnosed by skin biopsy.
- Histopathology: Demonstrates an intradermal blister; the earliest changes consist of intercellular edema with loss of intercellular attachments in the basal layer
- Direct immunofluorescence: On normal-appearing perilesional skin, demonstrates in vivo deposits of antibodies and other immunoreactants, such as complement.
- Indirect immunofluorescence: If DIF results are positive; circulating intercellular antibodies are detected using IDIF in 80-90% of patients with pemphigus vulgaris.
- The most accurate test to measure PV antibodies in the blood is called the ELISA test but it is not available in all laboratories. It measures the level of antibodies in the blood (titre). This is useful for monitoring how active the PV is, which might mean changes in your treatment and therapy.

Treatment

The aim of treatment is to reduce the inflammatory response and autoantibody production. While target-specific therapy is not available, non-target-specific treatments currently are used. The most commonly used medications are corticosteroids.

Corticosteroids

Systemic corticosteroids are the best established therapy for the management of PV.

For people with mild disease, corticosteroid cream may be enough to control it. For others, the mainstay of treatment is corticosteroids, such as prednisone pills. Using corticosteroids for a long time or in high doses may cause serious side effects, including increased blood sugar, bone loss, an increased risk of infection, cataracts, glaucoma and a redistribution of body fat, leading to a round face.

Immunosuppressant

Medication such as azathioprine or mycophenolate mofetil prevents attacking healthy tissues. They cause serious side effects like infections.

Biological Therapies

Rituximab is given when other medications are not tolerated. This drug is given in form of injection. It targets white blood cells that are responsible for pemphigus antibodies production.

Antibiotics, antiviral and antifungal medicines

They are used to control infection.

Test for pemphigus vulgaris

In most cases, circulating antibodies can be detected by a blood test- Indirect immunofluorescence test. The level of antibodies fluctuates and reflects the effectiveness of treatment.

The severity of pemphigus can be scored using PDAI: Pemphigus Disease Area Index..

- PAAS: Pemphigus Area and Activity Score
- PAS: Pemphigus Activity Score
- ABSDIS: Autoimmune Bullous Skin Disorder Intensity Score
- Saraswat oral pemphigus scoring
- Pemphigus vulgaris lesion severity score
- Harman pemphigus grading
- Kumar scoring system
- Mahajan scoring system

Lifestyle changes to treat Pemphigus Vulgaris

Here are some tips for coping with pemphigus vulgaris:

- use a soft toothbrush and avoid spicy, crispy or acidic foods if you have blisters in your mouth
- take painkillers or use anaesthetic mouthwashes to relieve mouth pain, especially before eating or brushing teeth
- practice good oral hygiene – brush your teeth regularly and use antiseptic mouthwash
- avoid activities that could damage your skin, such as contact sports

- keep cuts or wounds clean to prevent serious skin infections
- contact your GP or dermatologist if you develop symptoms of an infection, such as pus building under the skin, or the skin becoming very painful, hot and red

Topical steroids

Glucocorticoids are used topically for dermatological conditions. They act by anti-inflammatory, immunosuppressant, vasoconstrictor antiproliferative actions. Intensity depends on the extent of absorption to deeper layer, thus lipophilicity determines the potency to great extent. The available preparations are graded as :

- Potent
 - ✓ Beclomethasone dipropionate
 - ✓ Betamethasone benzoate
 - ✓ Betamethasone valerate
 - ✓ Halcinonide
 - ✓ Clobetasol propionate
 - ✓ Dexamethasone sodium phosphate
 - ✓ Dexamethasone trimethyl acetate
 - ✓ Fluocinolone acetonide
 - ✓ Fluocortolone
 - ✓ Triamcinolone acetonide
- Moderately Potent
 - ✓ Fluocinolone acetonide
 - ✓ Clobetasol butyrate
 - ✓ Fluocortolone
 - ✓ Mometasone
 - ✓ Fluticasone propionate
 - ✓ Prednicarbate
 - ✓ Triamcinolone acetonide
 - ✓ Hydrocortisone + urea
 - ✓ Hydrocortisone + acetate
- Mild
 - ✓ Hydrocortisone acetate
 - ✓ Hydrocortisone butyrate

General guideline for use of topical steroids

- Penetration of the steroid at different sites differs markedly. Areas of high penetration easily develop adverse effects while areas of low penetration do not generally respond to milder agents.
- Absorption into the skin also depends on the nature of lesion-high in atopic and exfoliative dermatitis, low in hyperkeratinized and plaque forming lesions.
- Lotions and creams are better for exudative lesions-they allow evaporation, have a cooling, drying and antipruritic effect. Sprays and gels are good for hairy regions. Ointments form an occlusive film and are good for chronic, scaly conditions

- d. Routine use of potent steroids is not justified. The mildest preparation that will control the lesion should be used.
- e. Use of potent preparations should be short term or intermittent to prevent adverse effects and tachyphylaxis.
- f. Generally twice daily application is satisfactory. A combination of steroid with an antimicrobial may be used for impetigo, furunculosis, secondary infected dermatoses, napkin rash, otitis externa, intertriginous eruptions.

Market Analysis

A marketing analysis is a study of the dynamism of the market. It is the attractiveness of a special market in a specific industry. It is done so that company can formulate a strategy on how to run business.

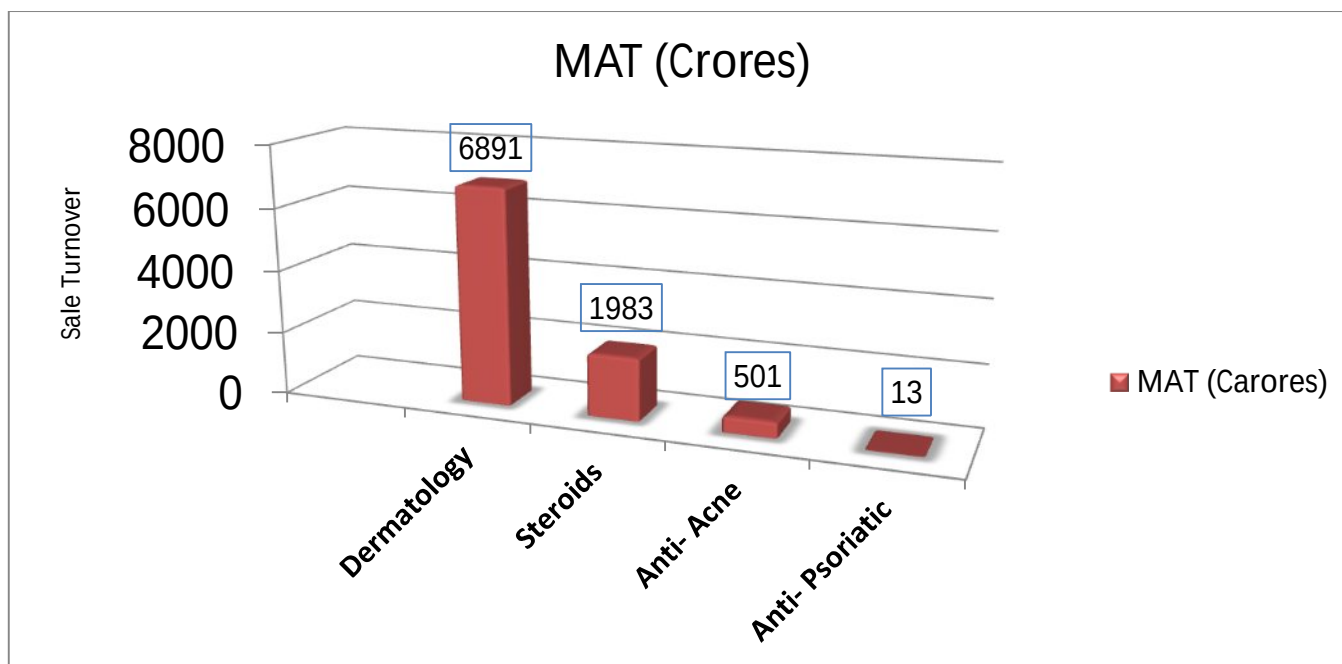
It is an important work other than promotion and sampling of existing brands in the company. Companies use various software like AOCD, IMS- health to know various factors like :

- Market size
- Growth rate of the market
- Market trends
- Market profitability
- Key success factor
- Distribution channel
- Industry cost structure
- Competitors

Market analysis is done in every month so that marketing techniques can be applied to all the products and products line, in all the division on mankind pharma to manage the existing brands.

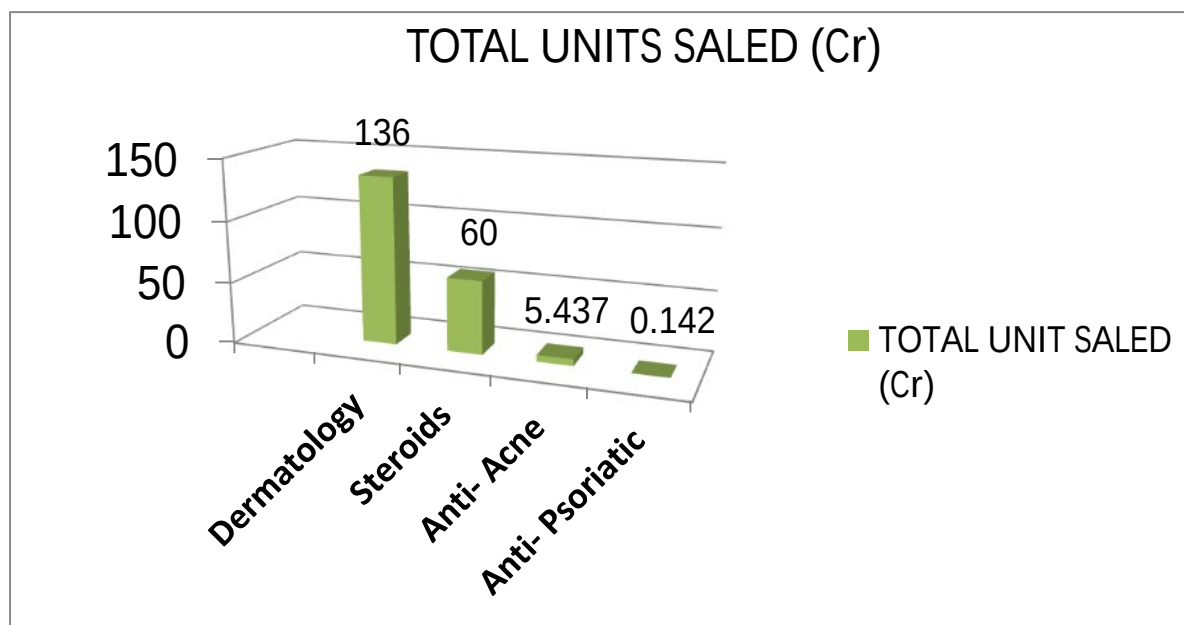
So market analysis of dermatology segment was done in order to know about the market scenario of all the products and products line.

LAST ONE YEAR SALE OF DERMATOLOGY MARKET



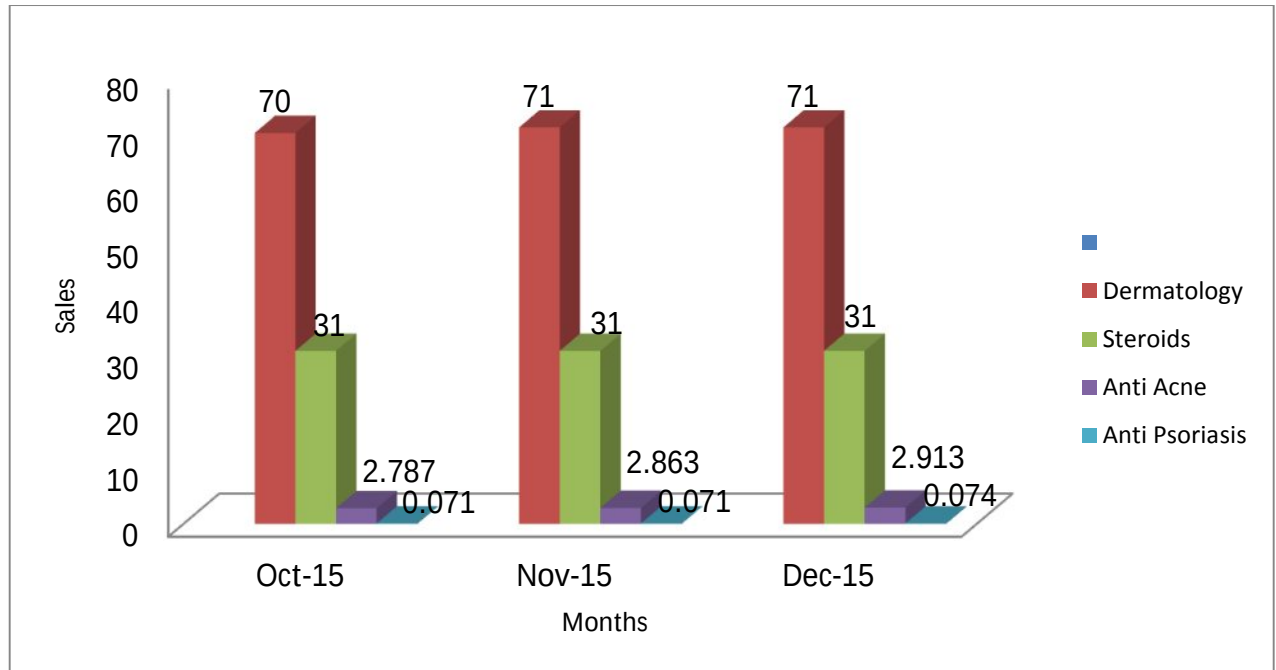
Graph 7

TREND OF DERMATOLOGY MARKET



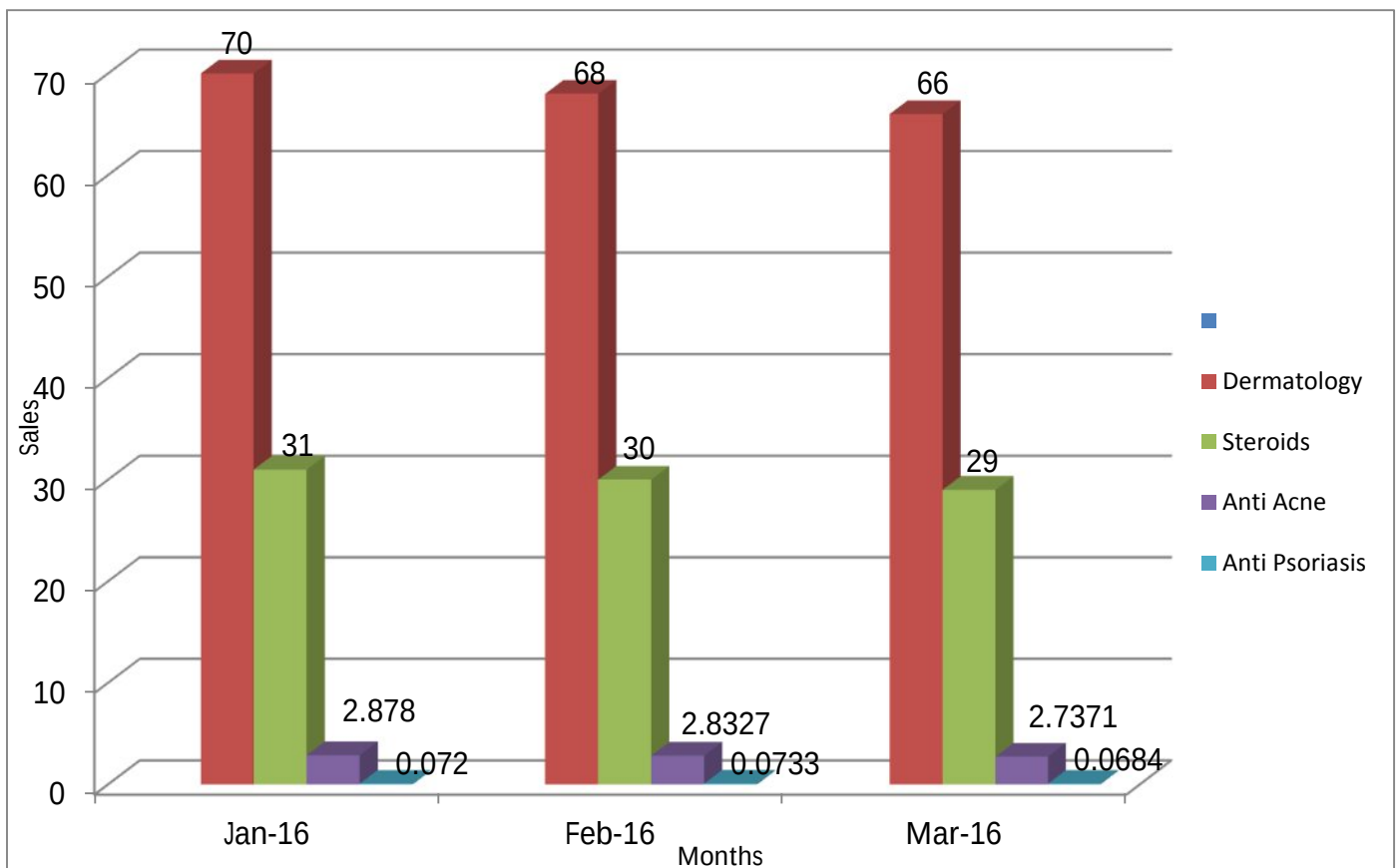
Graph 8

Three Months (Oct- dec) Sale of Dermatology Market



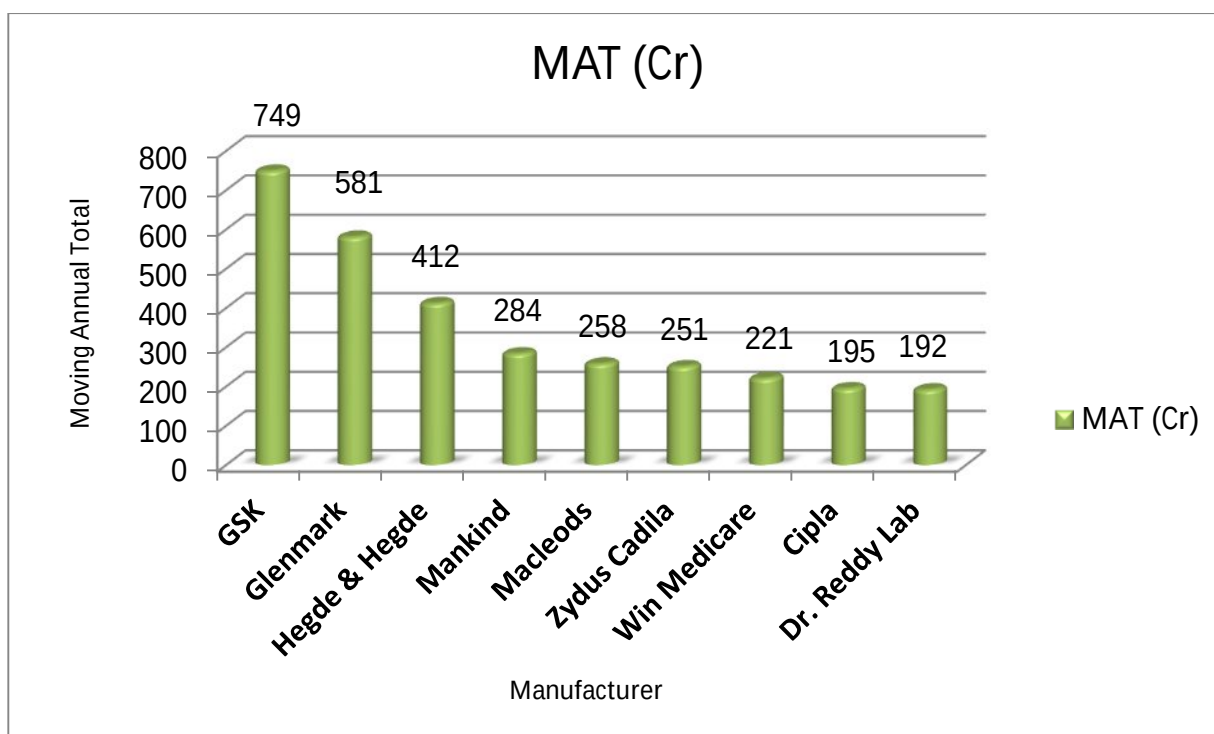
Graph 9

Three Months (Jan- Mar) Sale of Deramatology



Graph 10

Top 10 Companies in Dermatology



: MANKIND Pharma has been ranked 4th in Derma Segment.

Graph 11

IMS DATA FOR STEROIDAL DRUGS :

Molecule	MAT	TOTAL UNIT	Oct- 15	Nov- 15	Dec- 15	Jan-16	Feb- 16	Mar-16
Dermatology	6891	6892	70	71	71	70	68	66
Topical Corticosteroids	1983	1984	31	31	31	31	30	29
Cort+Antifungal+Antin	774	775	13	13	13	13	12	12
Clobet+ofl+orni+terbi	324	325	4	4	4	4	4	4
PANDERM (Macleod's)	231	232	2	2	3	3	3	3
TERBINAFORCE(Mankind)	29	30	2	1	1	1	1	0.4891
CANDID TOTAL(Glenmark)	13	14	2	0.139	0.143	0.139	0.134	0.123
TOATL DERM+ (Alkem)	9	10	2	0.179	0.181	0.176	0.171	0.1613
FUNZI(Corona Remedies)	8	9	2	0.114	0.118	0.112	0.108	0.0997
Beta+Genta+Mico comb	58	3.795	1.897	1.913	1.908	1.924	1.984	1.9004
BETNOVATE	42	2.579	1.289	1.291	1.269	1.286	1.303	1.2822
BETAMIL (Merck Limited)	13	1.094	0.539	0.552	0.571	0.575	0.575	0.5632
TAF GM (Helios)	2	0.078	0.045	0.042	0.042	0.038	0.036	0.0336
STEMING (Ind Swift)	0.395	0.018	0.009	0.011	0.011	0.009	0.009	0.0084
BETZEE GM (Apex)	0.163	0.017	0.008	0.01	0.01	0.01	0.01	0.0092
Clobetasol+Gen+Mico	28.35	2.156	1.225	1.2	1.167	1.101	1.03	0.9492
COSVATE (Adcock Ingram)	10.32	0.824	0.486	0.458	0.426	0.388	0.366	0.3406
CLOSTAR (Mankind)	5.392	0.196	0.106	0.106	0.104	0.099	0.093	0.0919
CLOBE (Laborate Pharma)	4.707	0.497	0.283	0.281	0.278	0.265	0.24	0.2176
ZINCODERM (Apex)	4.411	0.428	0.227	0.232	0.238	0.238	0.23	0.2066
ETAN (Invida India)	1.482	0.103	0.062	0.063	0.062	0.057	0.051	437
Other cort+Antifg+Antifec	26.59	0.459	0.245	0.246	0.246	0.238	0.23	0.219
HHDERM (HEDGE7HEDGE)	6.731	0.039	0.02	0.02	0.02	0.02	0.02	0.0194
NADIBACT PLUS (Cipla)	6.683	0.147	0.085	0.083	0.081	0.076	0.07	0.0632
NADIMIX (Wockhardt)	3.61	0.065	0.036	0.036	0.035	0.033	0.031	0.0294
3 MIX (Abbott healthcare)	2.436	0.053	0.028	0.028	0.028	0.027	0.026	0.025
BACTIMAX (Ajanta)	1.27	0.03	0.017	0.017	0.017	0.016	0.015	0.0142
Becl+Genta+Clotri Comb	16.24	0.654	0.359	0.363	0.363	0.346	0.328	0.3031
Nuforce (Mankind)	10.28	0.462	0.255	0.266	0.269	0.257	0.245	0.227
CUTICARE (DWD Pharama)	2.383	0.074	0.042	0.042	0.041	0.039	0.036	0.0335
Siloderm ixi (USV)	0.457	0.013	0.006	0	0	0	0	0
PRUDERM (Dales Pharma)	0.306	0.013	0.007	0.008	0.007	0.007	0.006	0.0055
CANDITAS-BG (Intas)	0.304	0.013	0.008	0.008	0.008	0.007	0.006	0.0054
Hydro + Neomy	9.172	0.295	0.166	0.189	0.18	0.166	0.156	0.1214
Neosporin	9.172	0.295	0.166	0.189	0.18	0.166	0.156	0.1214
Corticosteroids	284.6	4.749	2.334	2.339	2.395	2.4	2.396	2.3836
MOMETASONE (Glenmark)	82.69	0.789	0.393	0.394	0.399	0.396	0.394	0.391
ELOCON (Fulford)	19.63	0.202	0.1	0.101	0.102	0.101	0.101	0.1
HHSONE (Hedge&Hegde)	12.38	0.133	0.067	0.067	0.068	0.067	0.066	0.0663
MMS (Zydus Cdilla)	3.098	0.028	0.014	0.014	0.014	0.014	0.014	0.0135
MOMOZ (Unichem)	2.866	0.028	0.014	0.014	0.014	0.014	0.014	0.0138

IMS DATA FOR ANTI- ACNE DRUGS:

Molecule	MAT	TOTAL UNIT	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16
Anti-Ane Preparation	500.83	5.437	2.787	2.863	2.913	2.878	2.832	2.73
Other Antiacne	87.843	0.86	0.422	0.47	0.494	0.499	0.5044	0.4949
SAFI (Hamdard)	18.709	0.342	0.16	0.205	0.225	0.233	0.2388	0.2326
AZIDERM (Microlabs)	7.21	0.051	0.024	0.0205	0.025	0.026	0.0262	0.0271
PEROCLIN (Ajanta Pharma)	6.95	0.033	0.017	0.018	0.018	0.017	0.0165	0.0156
SASLIC (Cipla)	5.58	0.038	0.021	0.021	0.02	0.019	0.0181	0.017
PAPULEX (Invida India)	3.54	0.03	0.014	0.015	0.015	0.015	0.0158	0.0154
CLINDOXYL (GSK)	3.22	0.011	0.006	0.006	0.006	0.006	0.0058	0.005
Clindamycin+Nicotinamid	40.752	0.612	0.321	0.325	0.328	0.319	0.3077	0.2953
ACNESTAR (Mankind)	10.53	0.218	0.115	0.117	0.118	0.114	0.1098	0.1056
FACECLIN (Abbott)	8.2069	0.085	0.043	0.044	0.044	0.044	0.0442	0.0432
FEMCINOL (Dabur)	72839	0.095	0.049	0.05	0.05	0.049	0.0483	0.0467
CLIN- 3 (Unimarck Pharma)	3.0091	0.04	0.02	0.021	0.021	0.021	0.0211	0.0208
NILAC MRB (Microlabs)	2.9054	0.035	0.018	0.018	0.018	0.018	0.0175	0.0169
GLOCIN (Glowdera labs)	2.4586	0.028	0.014	0.015	0.015	0.015	0.0146	0.0143
CLID B2T (Bennet Pharma)	1.1257	0.025	0.012	0.013	0.014	0.014	0.0129	0.0119
NIOCLEAN (KL Labs)	0.8188	0.011	0.005	0.005	0.006	0.006	0.0056	0.0056
Anti-Acne Soaps	39.612	0.64	0.341	336	0.333	0.321	0.3119	0.2997
DERADEW (Hedge& Hedge)	13.459	0.131	0.069	0.069	0.069	0.066	0.0636	0.0622
Acnelak (Invida India)	7.3773	0.151	0.082	0.081	0.078	0.075	0.0727	0.0687
ACNIL (Mark Lab)	4.7436	0.126	0.066	0.063	0.063	0.062	0.0607	0.0584
AZAC (Mark lab)	2.1599	0.042	0.023	0.022	0.022	0.02	0.0198	0.0191
ACNE AID (Glaxos)	1.7252	0.025	0.013	0.014	0.013	0.013	0.0123	0.0119
Clindamycin+Adapalene	37.27	0.271	0.139	0.144	0.147	0.145	0.1412	0.1342
DERIVA (GSK)	14.399	0.086	0.043	0.045	0.046	0.046	0.0451	0.0434
ADALENE GEL (Zydus Cdila)	44176	0.027	0.013	0.014	0.014	0.014	0.137	0.0132
FACECLIN (Abbott)	2.922	0.022	0.011	0.012	0.012	0.012	0.0116	0.0111
ACNICIN(Alembic)	2.4793	0.026	0.014	0.014	0.014	0.014	0.0132	0.0123
ACNOVATE (Apex)	2.1344	0.017	0.009	0.009	0.009	0.009	0.0087	0.0081
Retinoic Acid	30.155	0.2777	0.132	0.136	0.142	0.146	0.1539	0.1504
Tretin(Hegde & Hegde)	8.2794	0.087	0.046	0.047	0.049	0.048	0.046	0.0436
RETINO A (Janssen)	8.0513	0.076	0.029	0.031	0.034	0.039	0.0484	0.0489
ARET (Invida India)	2.0186	0.034	0.018	0.018	0.019	0.018	0.0175	0.0169
YUGARD (Ranbaxy)	1.9742	0.003	0.001	0.001	0.002	0.002	0.0025	0.0024
SUPATRET (Sunpharma)	1.9576	0.016	0.008	0.009	0.009	0.009	0.0083	0.0079
Adapalene	12.767	0.095	0.05	0.051	0.052	0.051	0.0497	0.0477
DERIVA(Glenmark)	3.7904	0.026	0.014	0.014	0.014	0.014	0.0133	0.0126
ADAFERIN GLD(Galderma)	3.6205	0.022	0.012	0.012	0.011	0.011	0.011	0.0106
AP (Hegde& Hegde)	2.3223	0.026	0.014	0.014	0.014	0.014	0.0132	0.0128
OXIDOBEN (Cipla)	1.8499	0.008	0.003	0.004	0.005	0.005	0.0056	0.0054
ADIFF (Ipca Labs)	0.3722	0.004	0.002	0.002	0.002	0.002	0.0019	0.0019

Ayurvedic Prep	9.1019	0.172	0.079	0.081	0.086	0.091	0.0931	0.0929
CLARINA (Himalya Drug)	3.549	0.066	0.033	0.033	0.034	0.034	0.0339	0.0327
ACNE MOIST (Curatio)	0.9899	0.01	0.004	0.005	0.005	0.006	0.0061	0.0063
CUTFAR (Ban Labs)	0.7418	0.02	0.006	0.006	0.008	0.01	0.012	0.0132
TULASI (Himalya Drug)	0.6008	0.011	0.005	0.005	0.005	0.005	0.0056	0.0055
SKINELLE (Charak Pharma)	0.5047	0.006	0.003	0.003	0.003	0.003	0.003	0.0028
Isotretinoin	0.9336	0.008	0.004	0.004	0.004	0.0046	0.0046	0.0045
SOTRET (Croslands)	0.4591	0.003	0.001	0.001	0.001	0.001	0.0012	0.0012
ISOTINO (Kivi Labs)	0.3311	0.004	0.002	0.002	0.002	0.002	0.002	0.0019
ACNEX (Unisearch)	0.1099	0.001	0	0	0.001	0.001	0.0011	0.0011
TRET (West Coast Pharma)	0.1099	0.001	0	0	0.001	0.001	0.0011	0.0011
ACNO (Ajanta Pharma)	0.0074	0	0	0	0	0	0.0001	0.0001
ISOTROIN (Cipla)	0	0	0	0	0	0	0	0
Erthromycin	0.282	0.017	0.01	0.009	0.008	0.007	0.0071	0.007
TICIN (Torque Pharma)	0.2343	0.015	0.009	0.008	0.007	0.007	0.0063	0.0064
RAKCEN (Rekvina)	0.202	0	0	0	0	0	0.0002	0.0002
ACNO (Intas)	0.0101	0.001	0.001	0	0	0	0.0004	0.0003
ERYSIL (RPG Lifescience)	0.0083	0	0	0	0	0	0.0001	0.0001
REKCIN (Rekvine)	0.0078	0	0	0	0	0	0.0001	0.0001

IMS DATA FOR ANTI- PSORIASIS DRUGS:

Molecule	MAT	TOTAL UNIT	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16
Antipsoriasis Topical	12.5421	0.142	0.071	0.071	0.074	0.072	0.0733	0.0684
COA TAR SULPHUR	8.5256	0.121	0.062	0.062	0.064	0.062	0.0628	0.0576
IONAX	3.1229	0.021	0.021	0.011	0.01	0.01	0.0102	0.0098
DIAFOOT	2.0003	0.017	0.008	0.008	0.008	0.008	0.0089	0.0091
PROTAR	1.3498	0.014	0.007	0.007	0.007	0.007	0.0071	0.0072
DECORN	0.4909	0.024	0.012	0.012	0.011	0.011	0.0114	0.0114
CAREL	0.3038	0.004	0.002	0.002	0.002	0.002	0.0021	0.0022
Calcipotriol	4.0165	0.021	0.01	0.009	0.01	0.01	0.0105	0.0108
PASITREX (Sunpharma)	1.6284	0.008	0.004	0.003	0.003	0.004	0.0041	0.0043
SORVATE (GMK)	1.5274	0.009	0.004	0.004	0.005	0.004	0.0045	0.0046
CALPSOR (Biocon)	0.39	0.002	0.001	0.001	0.001	0.001	0.0012	0.0012
HEXIMAR (Invida India)	0.3027	0.001	0.001	0.001	0.001	0.001	0.0006	0.0006
SORFIL (Fourt India)	0.1679	0	0	0	0	0.0001	0.0001	0.0001
Cicatrizantsex. Dressings	2.0704	0.14	0.088	0.092	0.092	0.087	0.076	0.0619
KAROIN DRY (Dry)	1.8865	0.138	0.087	0.091	0.091	0.086	0.0753	0.0613
MISTDRESS (Midas Care)	0.1781	0.001	0.001	0.001	0.001	0.001	0.0006	0.0005
HEALEX (Shreya life science)	0.0053	0	0	0	0	0	0	0
GERMSKUTTER (Queensz Pharma)	0.0005	0	0	0	0	0	0	0

CONCLUSION

Rising demand for dermatological drugs, expanding healthcare coverage, the success of biological drugs, and antibacterial drug resistance will aid in the growth of the overall market to 2025. Bacterial resistance is at the alarming stage because of irrational use of antibiotics. Hence, search for new lead molecule/bioactive and rational delivery of the existing drug (for better therapeutic effect) to the site of action is the need of the hour. The total market of anti-acne in is 500.83 crores and analyses show that emerging economies, particularly in South America and Asia, will continue to achieve high revenue growth to 2025. Various economic, geographical, and regulatory factors globally will influence the market.

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