

# DERMA *Digest*



## ALOPECIA: PREVALENCE, SIGNIFICANCE AND MANAGEMENT

### Alopecia

Alopecia is the hair loss of the scalp that affects most males and about 30% of females during their lifetime. As per the literature, the term androgenetic alopecia (AGA) is frequently used for alopecia in general, as more than 90% of alopecia is caused by AGA. In addition to AGA, there are other less common reasons behind alopecia, which include reversible episode of telogen effluvium, alopecia areata, eczema seborreum, scalp/hair trauma, lichen planus, or thyroid deficiency. A thorough history and physical examination, as well as laboratory tests to support relevant findings and scalp biopsies help in making the diagnosis of AGA.<sup>1</sup>

#### Prevalence of alopecia

The prevalence of alopecia increases steadily with advancing age in both, males and females. The studies focusing on the prevalence of alopecia are shown in Table 1. Aforementioned studies have mostly used generally accepted scales of classification.<sup>1</sup>



Table 1: Prevalence of alopecia based on previous studies.

| Study, Year                     | Design     | Study population                            | Prevalence (%) |
|---------------------------------|------------|---|----------------|
| Birch <i>et al.</i> 2001        | Clinical   | 377 females, 18–99 years pre/postmenopausal | 6/38           |
| Pathomvanich <i>et al.</i> 2002 | Clinical   | 1124 males, 18–80 years                     | 39             |
| Severi <i>et al.</i> 2003       | Population | 1390 males, 40–64 years                     | 73             |
| Chumlea <i>et al.</i> 2003      | Population | 254 males, 18–49 years                      | 55             |
| Grover <i>et al.</i> 2005       | Clinical   | 2445 males, 20–70 years                     | 31             |

### Why alopecia needs to be taken seriously?

Alopecia is a psychologically damaging condition that results in intense emotional suffering, and causes personal, social, and work-related problems. An important link exists between hair and identity, particularly for women. Nearly 40% of females with alopecia have experienced marital problems as a consequence, and approximately 63% claimed to have career-related problems. Psychological distress and psychiatric

disorders are found to be more common in individuals with alopecia than in the general population. This suggests that people with alopecia are at a higher risk for developing a serious depressive episode, anxiety disorder, paranoid disorder, or social phobia. It is observed that they also experience poor quality of life, lower self-esteem, and poor body image.<sup>2</sup>

### Factors contributing to alopecia

There is no general agreement regarding the main factors behind hair loss. There may be one or multiple factors resulting in hair loss, which are summarized as follows:<sup>3</sup>

#### Local factors

Some of the local factors or conditions associated with hair loss include:

- a. Leaky gut syndrome
- b. Local exposure to toxins
- c. Scalp carelessness

#### General factors

##### a. Deficient nutrition

Minerals, such as iron, copper, calcium, chromium, iodine, zinc, and magnesium, are important for maintaining healthy hair growth. Mineral deficiency can lower the chance to regulate blood circulation, that helps in promoting healthy hair growth. The thyroid hormones aid in preventing dry hair and hair loss as well as defects in hair color. Vitamin B (especially B<sub>6</sub>, B<sub>3</sub>, B<sub>5</sub> and folic acid), biotin and vitamin A are important for overall good health. They are also beneficial to hair follicles, as they keep the hair root lubricated. Vitamin E acts as an antioxidant that helps in effective circulation in the scalp due to increased oxygen uptake in blood, thus playing an important role in promoting hair growth and preventing hair loss.<sup>4</sup>

Alopecia is a psychologically damaging condition that results in intense emotional suffering, and causes personal, social, and work-related problems.

- b. Hormonal variations
- c. Post-acute ailment
- d. Medicine and drug-induced

Psychological factors

Toxins in the liver

## Treatment

### Role of nutritional supplements in hair growth

#### Amino acids

Chemically, hair comprises of 97% protein and thus is primarily made up of amino acids, which are the building blocks of proteins.<sup>5</sup> L-methionine aids in preventing hair fall and promoting blood supply to the scalp.<sup>6</sup> Thus, it can considerably strengthen the hair structure.<sup>7</sup> L-lysine, the amino acid prevalent in vegetables and legumes, inhibits 5  $\alpha$ -reductase type II.<sup>8</sup>

#### Gamma-linolenic acid

Gamma-linolenic acid has shown to stop the thinning of hair.<sup>9</sup>

#### Biotin

Biotin plays an important role in a number of enzymatic reactions within the body, and is required for proper metabolism of protein, fat, and carbohydrates. Over a period of time, poor metabolism of nutrients can lead to undernourished hair follicle cells. Biotin deficiency can result in hair loss. A study conducted at Harvard University suggested that biotin is one of the most crucial nutrients for preserving hair strength, texture, and function.<sup>8</sup>

#### Vitamin B<sub>2</sub>, niacin and pantothenic acid

Reduced levels of riboflavin (vitamin B<sub>2</sub>), niacin, and pantothenic acid can result in the undernourishment of hair-follicle cells.<sup>8</sup>

#### Folic acid

A reduction in folic acid may contribute to decreased hair-follicle cell division and growth. Folic acid is also important for the maintenance of healthy methionine levels in the body. Signs of folic acid deficiency are anemia, fatigue, and graying of hair.<sup>8</sup>

#### Inositol

Inositol is a precursor for phospholipids. Phospholipids are considered to be important for healthy hair follicle development.<sup>8</sup>

### Finasteride in androgenetic alopecia

Finasteride is the first and only oral medication to be approved by the Food and Drug Administration in treatment of male-pattern hair loss. Finasteride is a specific inhibitor of type II, 5  $\alpha$ -reductase, which converts testosterone into dihydrotestosterone that affects the hair follicle regression. By decreasing scalp tissue levels of dihydrotestosterone, finasteride aids in suppressing male-pattern hair shedding.<sup>10</sup>

Various publications have listed the usefulness of this drug in the treatment of androgenetic alopecia. A systematic review of 12 studies has presented moderate quality evidence which suggests that the daily use of oral finasteride assists in increasing hair count. Long-term use of finasteride for up to 5 years has shown to reduce the likelihood of developing further visible hair loss. A study of 270 men with high levels of serum 5  $\alpha$ -dihydrotestosterone noted that initiating the drug in younger patients had a better response. A double-blind study conducted recently

Biotin is one of the most crucial nutrients for preserving hair strength, texture, and function.

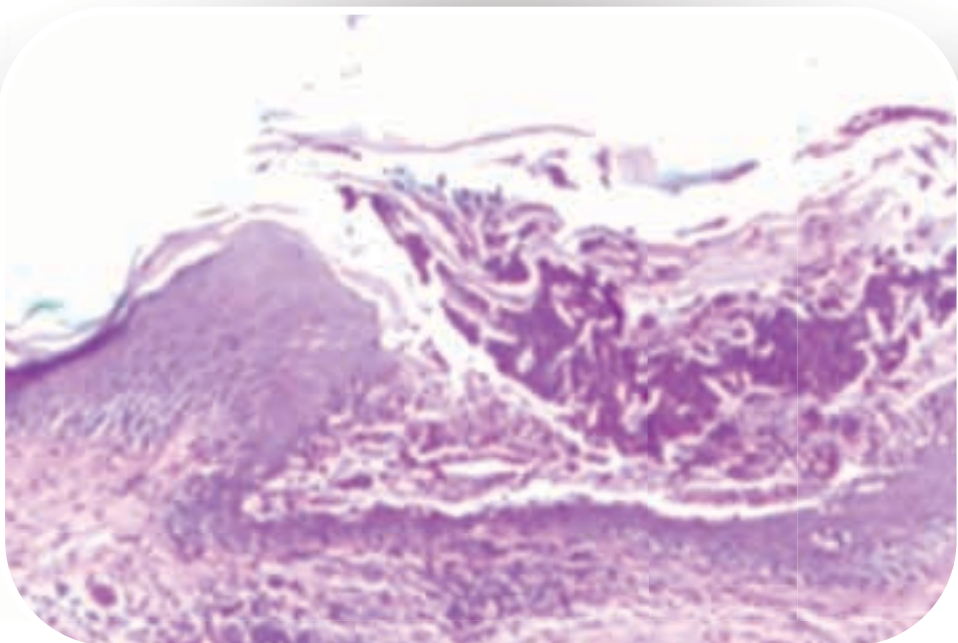
## QUIZ 3: Learn Basics in Dermatopathology

**Dr. Vinoo Sekhri**

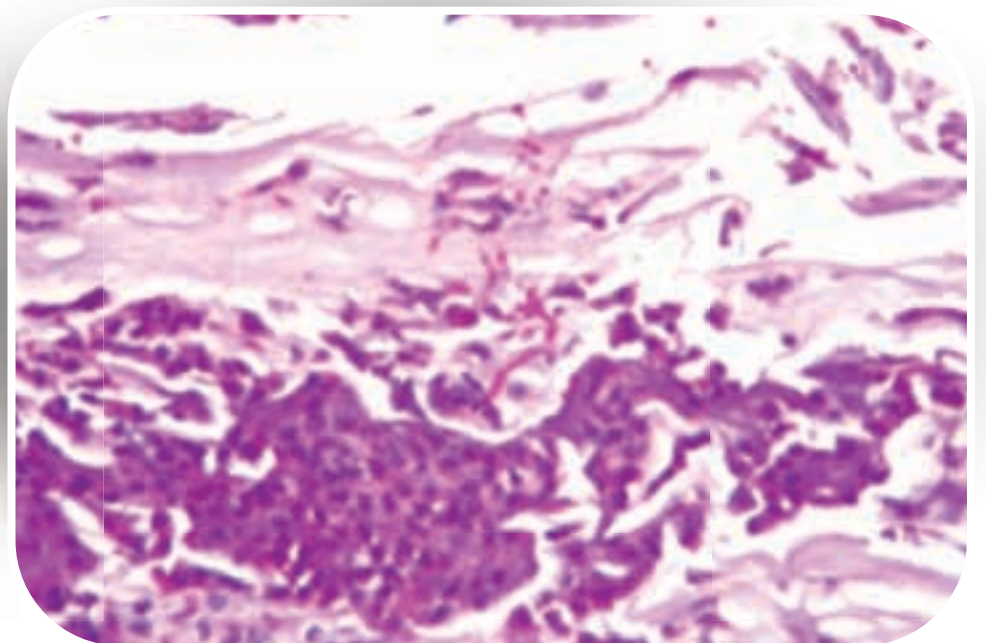
MD Dermatopathology

vinoo.sekhri@hotmail.com

Q: What do you think of the findings in the stratum corneum?



Skin biopsy of a fluid-filled vesicle on the great toe of foot.



High-power view of the contents of the vesicle.



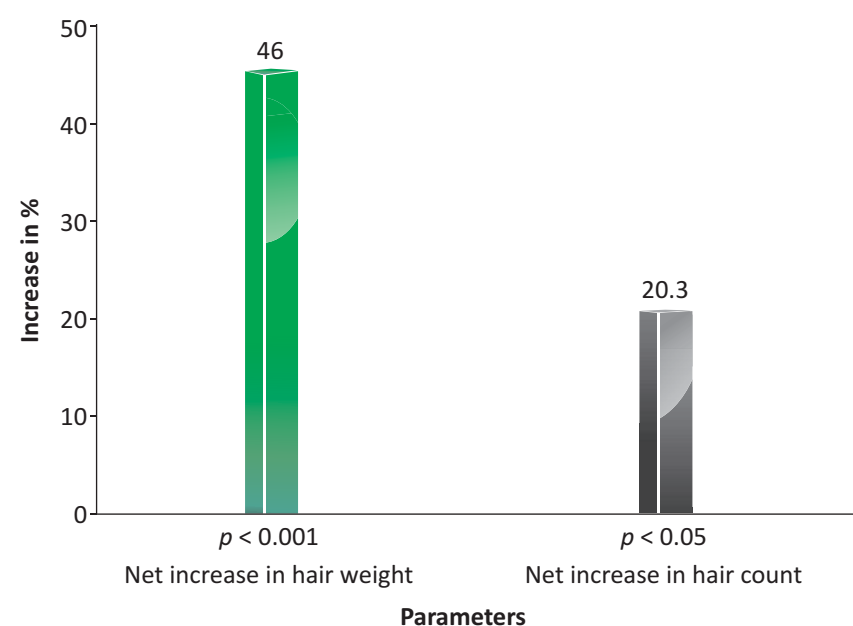
revealed that the therapeutic effects of 1% finasteride gel applied twice daily and oral finasteride, 1 mg daily were relatively similar. Topical finasteride can be considered as a choice for hair density maintenance after initial improvement with oral finasteride, thus avoiding the need for using oral finasteride indefinitely.<sup>11</sup>

A study conducted to evaluate the effects of finasteride on hair weight and count over 4 years in men with AGA revealed good results of finasteride over placebo in terms of hair count and hair weight as shown in Figure 1.<sup>12</sup>

These studies revealed that the drug is efficacious in treatment of hair loss. It shows better effects when started early, and the effect is sustained with long-term use for up to 10 years.<sup>11</sup>

Topical finasteride can be considered as a choice for hair density maintenance after initial improvement with oral finasteride, thus avoiding the need for using oral finasteride indefinitely.

Figure 1: Increase in hair weight and hair count with finasteride 1 mg over placebo



## SNIPPETS

- » Alopecia is a psychologically damaging condition that results in intense emotional suffering.
- » Finasteride is clinically proven to be effective in the treatment of AGA.
- » Nutritional supplements play a vital role in promoting hair growth and preventing hair loss.

## References

1. Hirso P. Alopecia; Its prevalence and association with cardiovascular diseases, risk factors and quality of life —Cross-sectional population-based studies. *Acta Univ. Oul.* 2007; D 939. 2. Hunt N, McHale S. The psychological impact of alopecia. *BMJ.* 2005 Oct 22;331(7522):951–3. 3. Kaur H, Kumar S, Kaur G, Kaur M, Rathore MS. Alopecia- Factors contributing, diagnosis and treatment. *IJPCBS.* 2013;3(4):1191–9. 4. Kaushik R, Gupta D, Yadav R. Alopecia: Herbal remedies. *IJPSR.* 2011;2(7):1631–7. 5. Patil SM, Sapkale GN, Surwase US, Bhombhe BT. Herbal medicines as an effective therapy in hair loss – A review. *RJPBCS.* 2010 April–Jun;1(2):773–81. 6. Jain PK, Joshi H, Dass DJ. Drug that causes hair loss and promotes hair growth - A review. *International Journal of Research in Pharmaceutical and Biomedical Sciences.* 2012 Oct–Dec;3(4):1476–82. 7. Amino acids and their significance for healthy hair [Internet][Updated on Jan, 2016] Available at: <http://www.aminoacid-studies.com/areas-of-use/hair.html>. Accessed on Apr 21, 2016. 8. Bruno G. Have a “Good hair day” [Internet] Available at: <http://www.hchs.edu/literature/Hair.pdf>. Accessed on Apr 21, 2016. 9. Gist T. You too, can have the fruits of life! without “White Folks” BS. Chicago: Hannibal At The Gates Publishing Co; 2006. 10. Kaur H, Kumar S, Kaur G, Kaur M, Rathore MS. Alopecia- Factors contributing, diagnosis and treatment. *IJPCBS.* 2013;3(4):1191–9. 11. Mysore V, Shashikumar BM. Guidelines on the use of finasteride in androgenetic alopecia. *Indian J Dermatol Venereol Leprol.* 2016 Mar–Apr;82(2):128–34. 12. Price VH, Menefee E, Sanchez M, Kaufman KD. Changes in hair weight in men with androgenetic alopecia after treatment with finasteride (1 mg daily): Three- and 4-year results. *J Am Acad Dermatol.* 2006 Jul;55(1):71–4.

# COAL TAR AND SALICYLIC ACID IN SCALP PSORIASIS

## Scalp Psoriasis

Psoriasis of the scalp is known to be a frequently occurring condition.<sup>1</sup> Scalp is considered to be the first site of involvement in approximately 25% of the patients with psoriasis. Around 79% of patients with chronic plaque psoriasis may present with scalp involvement.<sup>2</sup> The sharply demarcated erythematous lesions with silver-white scaling are the characteristics of scalp psoriasis. The quality of life can be seriously hampered by this condition, leading to a requirement of long-term treatment in most patients.<sup>1</sup>

## Coal Tar and Salicylic Acid in the Treatment of Scalp Psoriasis

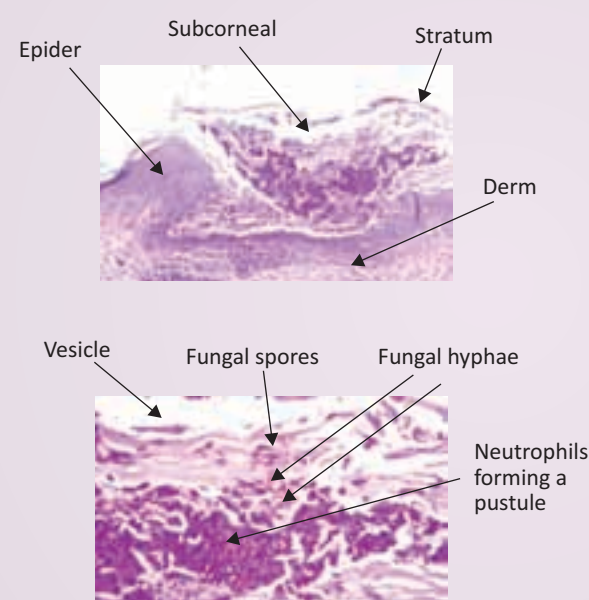
Coal tar is considered to be an effective and a cheap treatment option for scalp psoriasis. Topical tar solution, such as liquor picis carbonis (LPC) or liquor carbonis detergens (LCD), is the widely available choice, commonly used for scalp psoriasis. Newer preparations specifically meant for scalp psoriasis comprises of coconut oil compound ointment (coal tar solution with precipitated sulfur, salicylic acid, coconut oil, yellow soft paraffin and emulsifying wax) and tar pomades (contain LCD, Tween 20 and salicylic acid in a hydrophilic ointment). Compound ointment needs to be applied once at night and washed off in the morning with the use of coal tar shampoo. Coal tar shampoos have 1–20% coal tar extract. They should be used twice a week.<sup>2</sup>

Salicylic acid 5 to 10% is associated with a pronounced keratolytic effect and is used in combination with other topical modalities.<sup>1,2</sup> Salicylic acid formulated in an ointment form is easy to wash off.<sup>1</sup>

## References

1. van de Kerkhof PC, Franssen ME. Psoriasis of the scalp. Diagnosis and management. *Am J Clin Dermatol.* 2001;2(3):159–65.
2. Handa S. Newer trends in the management of psoriasis at difficult to treat locations: Scalp, palmoplantar disease and nails. *Indian J Dermatol Venereol Leprol.* 2010 Nov–Dec;76(6):634–44.

## Quiz Answer



The vesicle is beneath the stratum corneum, so it is subcorneal.

It contains fungal hyphae, fungal spores and neutrophils. Fungal hyphae are filamentous and fungal spores are rounded structures.

Neutrophils are present as a mass.

These findings are seen in vesicular tinea.

# Case Study of a Female Androgenetic Alopecia Successfully Treated with Finasteride and Nutritional Supplement



Contributed by:

**Dr. Shweta Virmani**

MBBS, MD, FAAD

Aesthetic Dermatologist

Director - Kaya N Derma, Saharanpur, UP

Consultant - DHI Global,

HOD Dept. of Skin - SMMH Medical College, Saharanpur, UP

## Case Profile

A 47-year-old woman presented to the clinic with complaints of excessive hair loss and thinning of hair from the past one and a half year; no family history of hair loss was reported. She had been prescribed minoxidil solution 2%, which she used for a few months but failed to get any improvement, and therefore, subsequently discontinued the same. The patient denied any recent illnesses or surgeries; however, she had undergone hysterectomy 3 years back. She also denied the use of new medications or any recent stressful events.

On physical examination, diffuse thinning on the majority of scalp hair was noted. A hair pull test was positive, with more than 8 telogen-appearing hairs pulled on 4 attempts. Digital microscopic evaluation displayed about 80% miniaturization of hair follicles diffusely, with around 100% miniaturization on the frontal scalp. All laboratory tests, including androgen levels were found to be within the reference range. The differential diagnoses of female androgenetic alopecia included telogen effluvium, diffuse alopecia areata, and diffuse androgenic alopecia. A punch biopsy revealed 22 hair follicles: 13 terminal, 8 vellus, and 1 telogen/catagen hair follicle. The terminal to vellus ratio was found to be 1.6 to 1. The peribulbar or peri-infundibular infiltrates were absent. Mucin, interface change, or scarring was not observed.

The findings were suggestive of female androgenetic alopecia.

She was started on a therapy with finasteride 1.25 mg daily along with nutritional supplement containing linolenic acid, multivitamin, minerals, amino acids, and biotin. No oral contraceptive was added.

During the first follow-up at 4 months after the initiation of treatment, she reported a remarkable reduction in shedding and displayed hair regrowth. She was pleased with the results and continued to use the same treatment.

Female pattern hair loss is a broad term used for the reduction in central scalp density, which is often seen after puberty in females.

## Discussion

Female pattern hair loss (FPHL) is a broad term used for the reduction in central scalp density, which is often seen after puberty in females. Although FPHL does not cause any serious health consequences, it is distressing and is reported to affect approximately 50% of females over 50 years of age. Some FPHL-affected females are observed to respond to anti-androgens or 5  $\alpha$ -reductase inhibitors. This is indicative of an androgen-related etiology in quite a few cases.<sup>1</sup>

Boersma *et al.*, conducted a study<sup>2</sup> to evaluate the efficacy of finasteride 1.25 mg on hair loss in women with androgenetic alopecia. The study was continued for 3 years. The women were divided in 2 categories; one containing women of 50 years and above and the other including women below 50 years of age.

A statistically significant increase in hair thickness was observed from baseline over the 3-year period, which was 83.3% in above 50 years group and 80% in below 50 years age group, with overall effectiveness of 81.7%.<sup>2</sup>

A good scalp coverage and hair structure (SCHS) assessments and effectiveness were seen after 3 years of treatment with finasteride, as shown in Table 1.<sup>2</sup>

Table 1: Scalp coverage and hair structure assessments and effectiveness of finasteride 1.25 mg

| Age category (%) | SCHS < 0 (n) | SCHS $\geq$ 0 (n) | Effectiveness (%) |
|------------------|--------------|-------------------|-------------------|
| < 50 years       | 31           | 59                | 65.6              |
| $\geq$ 50 years  | 25           | 65                | 72.2              |
| All ages         | 56           | 124               | 68.9              |

It is known that nutrition influences hair loss and hair conditions, as illustrated by the hair problems associated with disorders caused by severe malnutrition, such as anemia, anorexia nervosa, bulimia, and kwashiorkor. Vitamins, minerals, and other nutrients are frequently used in a large range of products that claim to be efficient against hair loss.<sup>1</sup>

A study<sup>1</sup> was conducted by Le Floc'h *et al.*, to evaluate the efficacy of a nutritional supplement on hair loss and hair condition versus control. A total of 120 healthy female volunteers, aged 18–65 years and presented with stage I hair loss, were recruited in the study.

After 6 months of treatment, photograph assessment demonstrated a superior improvement in the supplemented group ( $p < 0.001$ ). A large majority of supplemented subjects reported a reduction in hair loss (89.9% of subjects at 6 months), as well as an improvement in hair diameter (86.1%) and hair density (87.3%).<sup>1</sup>

Thus, nutritional supplements along with finasteride provide an effective treatment option for androgenetic alopecia.

## References

1. Le Floc'h C, Cheniti A, Connétable S, Piccardi N, Vincenzi C, Tosti A. Effect of a nutritional supplement on hair loss in women. *J Cosmet Dermatol*. 2015 Mar;14(1):76–82.
2. Boersma IH, Oranje AP, Grimalt R, Iorizzo M, Piraccini BM, Verdonchot EH. The effectiveness of finasteride and dutasteride used for 3 years in women with androgenetic alopecia. *Indian J Dermatol Venereol Leprol*. 2014 Nov–Dec;80(6):521–5.

Developed and Designed by



Supported by



**Copyright:** All rights reserved. No part of this print publication may be reproduced, stored in retrieval system, tapes, discs, microfilms, etc., or transmitted in any form or by any means electronic, mechanical, photocopies, recording or otherwise, without the written permission of Insignia Communications Pvt. Ltd., Mumbai.

**Disclaimer:** Scientific contents of this publication have been compiled by clinicians and medical writers of Insignia Communications Pvt. Ltd. with unrestricted educational grant from Canixa Life Sciences from reasonable sources, acknowledged and accredited by author(s) and contributors of the material referenced herein. This publication is distributed free of cost to medical professionals for information purpose only and not for any other purpose. The views, if any, expressed in this publication are not influenced by any opinion or suggestion by Canixa Life Sciences and are solely the views of medical experts. The contents or the literature shall not be relied upon in any manner for treatment of any kind of disease or injury. Although all reasonable care has been taken in compiling and checking the contents of this publication, the authors or Canixa Life Sciences, or its directors, employees or agents shall not be responsible or liable in any manner whatsoever and howsoever for any death, injury or damage to any person due to any error, omission or inaccuracies in this publication whether arising from unawareness, ignorance or otherwise.