

POSSIBLE ROLE OF TOPICAL MAGNESIUM SULFATE IN IMPROVING GROWTH AND STRENGTH OF SCALP HAIR

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In nerve and muscle pain management we have previously documented significant improvements with the use of transdermal magnesium sulfate (1-5) and we are currently exploring its use in other conditions.

This manuscript will discuss possible usefulness of topical magnesium sulfate in the management of health related hair growth and hair strength.

It is typical to lose some dozens of scalp hairs every day as part of the hair's usual growth cycle. For most people, the lost hairs grow back and overall, one maintains a full head of hair. However, illness, chemotherapy, hormonal changes, stress, aging and inherited conditions can negatively interfere with the hair growth cycle. More hairs fall out, and new strands do not necessarily always grow back.

OVERVIEW

Most healthy people lose up to 100 strands of scalp hair per day. As part of the hair's growth cycle, new strands grow and take the place of the shed hair.

When one starts to shed more strands while fewer or none grow back, the condition is considered alopecia (hair loss). There are several types of hair loss, and it can affect adults of any gender and even children. The hair loss may occur not just on the head but on the body as well.

Types of hair loss

Some types of hair loss are permanent, while others are temporary.

The most common types of hair loss include.

- Androgenic alopecia: This type of hereditary baldness can affect anyone (male pattern baldness or hair loss in women).
- Alopecia areata: Alopecia areata is an autoimmune disease that results in hair loss from the head and body.
- Telogen effluvium: This type of hair loss involves rapid shedding of hair in a short amount of time. It typically happens a few months after your body goes through something physically or emotionally

stressful. It can also result from sudden hormonal changes.

- Anagen effluvium: This very rapid hair loss occurs due to certain medical treatments, such as chemotherapy.

Prevalence of hair loss

Androgenic alopecia (baldness) is the most common type of hair loss. It affects an estimated 80 million individuals in the USA.

Hair loss is one of the most common side effects of chemotherapy.

Alopecia areata affects up to 6.8 million people in the USA.

Causes and symptoms

Causes of hair loss

Hair loss has many possible causes. The most common include.

- Hereditary genetics.
- Medical treatments (e.g. chemotherapy, certain medications).
- Thyroid disease.
- Hormonal changes (e.g. pregnancy, childbirth, menopause).
- Fungal infections.
- Stressful events, physical and mental (e.g. surgery, grief).

- Nutritional deficiencies (especially insufficient iron and protein).
- Hairstyles that pull the hair tightly (e.g. braids, hair extensions, tight ponytails).
- Haircare that includes chemical agents (e.g. perms, bleach).
- Use of hard water and de-ionized water.^[6,7]

Symptoms of hair loss

People experience hair loss in different ways, depending on the type of hair loss and what the cause is. Common symptoms include.

- Receding hairline (typical of male pattern baldness).
- Thinning hair diffusely over the head (typical of female pattern hair loss).
- Loss of small patches of hair on the scalp.
- Loss of hair on the scalp and body.
- Gradual thinning on top of head. This is the most common type of hair loss, affecting people as they age. In men, hair often begins to recede at the hairline on the forehead. Women typically have a broadening of the part in their hair. An increasingly common hair loss pattern in older women is a receding hairline (frontal fibrosing alopecia).

Losing hair, whether temporary or permanent, can be emotionally difficult for many people. Some types of hair loss can ultimately lead to baldness.

In case of extensive hair loss, it is important to protect the skin of the scalp. This can be achieved by wearing a hat, scarf or other head covering when in the sun, and applying high factor sunscreen daily. Sun exposure is known to increase the risk of skin cancer.

Patterns of hair loss

Circular or patchy bald spots.

Some people lose hair in circular or patchy bald spots on the scalp, beard or eyebrows. Scalp skin may become itchy or painful preceding the actual hair loss.

Sudden loosening of hair

A physical or emotional shock can cause hair to loosen. Handfuls of hair may come out when combing or washing your hair or even after gentle tugging. This type of hair loss usually causes overall hair thinning but is generally temporary.

Full-body hair loss

Some conditions and medical treatments, such as chemotherapy for cancer, can result in the loss of hair all over the body. The hair usually grows back.

Patches of scaling that spread over the scalp

This is a sign of ringworm. It may be accompanied by broken hair, redness, swelling and, at times, exudation.

Diagnosis and Tests

In some cases, the cause of hair loss is obvious, e.g. losing hair during chemotherapy.

Other times, a more extensive diagnostic work-up is necessary to determine a cause.^[6]

To determine the correct diagnosis, the following are essential.

- Family history, including if any relatives experienced hair loss and at what age.
- Personal medical history.
- Physical and UV-light examination of scalp (e.g. signs of infection).
- Blood tests (e.g. thyroid function and iron levels).
- Scalp/hair biopsy to check for specific skin/hair disease.

Management and Treatment

If hair loss results from medication, hormonal imbalances, thyroid disease or diet, correcting the underlying problem is mandatory to help stop and reverse hair loss.

Most hair loss treatments are meant to help with androgenic alopecia (male and female pattern hair loss). These treatments include.

- Medication: Lotions for applications locally to the scalp, such as minoxidil lotion, e.g. Rogaine®, are usually the first course of treatment for thinning hair, and are frequently available over-the-counter. A prescription oral medication (finasteride, e.g. Propecia®) is in the USA approved only for men with male pattern baldness.
- Hair transplant: During a surgical hair transplant, strands of hair are carefully removed from an area of the scalp where the hair is thickest. These strands are then transplanted, embedding them into the scalp to reconstruct the frontal hairline and where the hair is thinnest.
- Platelet-rich plasma (PRP): After venous blood drawing, the plasma is separated. This platelet-rich plasma is subsequently injected into the scalp. PRP treatment can help slow hair loss and encourage new hair growth.

Prevention of hair loss

Not all types of hair loss are preventable, but steps can be taken to help keep hair healthy and minimize loss.

To help prevent hair loss

- Eat a healthy diet that includes enough calories, protein and iron.
- Manage thyroid disease or other medical conditions that could result in hair loss.
- During chemotherapy treatment, consider using a cooling cap.
- Making sure that hair is not washed with hard water.^[6]
- Find ways to cope with stress.
- Avoid hairstyles that pull hair tightly.

Complications of hair loss

Hair loss can sometimes be a sign of an underlying disease. But hair loss itself poses no medical risk.^[8]

Baldness typically refers to excessive hair loss from the scalp. Hereditary hair loss with age is the most common cause of baldness. Some people prefer to let their progressive hair loss run its natural course leaving it untreated and unhidden. Others may prefer to cover it up with hairstyles, makeup, hats or scarves. And still others choose one of the treatments available to prevent further hair loss or restore growth.

Depending on what is causing hair loss, it may be temporary or permanent. Treatments can help people with certain types of hair loss. For conditions like alopecia areata that may affect children as well as adults, self-help groups can provide emotional support and can assist in buying wigs or find other ways to cope.

For personal purposes, magnesium sulfate has been used by us as a hair and scalp skin detoxifier for six months. We apply the lotion for 20 minutes to the entire area of the hairy scalp) before a hair wash. We have noted that our hair has gradually become stiffer and stronger. There is no further excess hair loss.

Addendum: Hair loss in patterns on trunk, and upper and lower limbs

Apart from certain medical conditions (e.g. hormonal deficiencies, and autoimmune conditions such as lupus) and medical treatments (e.g. chemotherapy) which can cause generalized hair loss in the limbs and all over the body, the authors wish to bring to the attention that in the back and front trunk as well as in the limbs hair loss may be seen in certain typical patterns in a number of peripheral neurological conditions.

The majority of these are probably of radicular origin, a condition in which one or more spinal nerve roots are affected. This can be due to e.g. herniations of intervertebral disks. A radicular distribution is also present in nerve inflammation e.g. herpes zoster infections (shingles). In spinal canal stenosis hair loss in the trunk and limbs can be quite pronounced and diffuse.

In fact, all peripheral nerve illnesses can result in hair loss in patterns. The distribution and extensiveness thereof depends on the location of the nerve lesion(s), and proximal nerve lesions (e.g. plexus brachialis) will result in larger hair loss regions than a distal nerve lesion (e.g. peroneal/fibular nerve entrapment at the fibular head).

In general, most of these peripheral nerve lesions do not lend themselves to local treatment with magnesium sulfate but rather need to be properly medically explored (e.g. MRI imaging), and treated appropriately (e.g. surgical decompression).

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