

## Normal saline used in successful treatment of localised lipoatrophy in children

Pankaj Kumar Tiwary<sup>1,\*</sup>, Pragya Gurudiwan<sup>2</sup>, RKP Chaudhary<sup>3</sup>

<sup>1</sup>Assistant Professor, <sup>2</sup>Junior Resident, <sup>3</sup>Professor & HOD, Dept. of Skin & VD, Patna Medical College, Patna, Bihar

**\*Corresponding Author:**

Email: drpkt97@gmail.com

### Abstract

Steroid injections are not very uncommon in dermatology and other clinical fields owing to their multifaceted actions. This double edged sword has many local adverse effects and doesn't even leave its site of penetration also and can result in persistent lipoatrophy, pigmentary changes and telangiectasia. Managing the lipoatrophy has been always a difficult task particularly in children. We successfully treated this by injecting 1 ml normal saline biweekly directly into area of lipoatrophy in 2 children. Lesion showed improvement just after first injection and after third session lesional area matched approximately with the surrounding skin with respect to depth, colour and texture. So Normal saline injection can be considered as a safe, economical, feasible and effective treatment option for steroid induced lipoatrophy in all age groups including children.

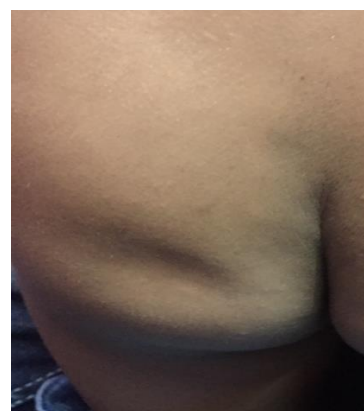
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### Introduction

We present cases of two children who have been treated successfully for lipoatrophy over gluteal region by intralesional injection of bacteriostatic normal saline. Lipoatrophy could result from both oral and local intralesional corticosteroid use and the buttocks and proximal extremities being the most commonly affected sites with oral use.<sup>(1)</sup> Not much studies have been done for corticosteroid induced lipoatrophy and its management particularly in children. Localized reactions to injected corticosteroids are thought to occur in less than 0.5% of cases, which primarily include haemorrhage, atrophy, secondary infection, changes in pigment, hypersensitivity reactions, and panniculitis.<sup>(2)</sup> The lipoatrophy usually appears within 3 months of injection and sometimes heal spontaneously.<sup>(3)</sup> We report case of two children who present with corticosteroid injection induced lipoatrophy over buttocks and parents were much concerned because of poor knowledge about the condition. We want to highlight the technique and frequency of injections to help clinicians attain better understanding about management of this condition.

### Case Presentation

A 5 years old girl presented to us with asymptomatic bilateral round depressed plaque of about 1.5 cm diameter and 1cm depth on each buttock. Overlying skin was depigmented and atrophic[Fig. 1]. Lesions started as small depression, gradually increased in size and were persistent since 5 months. Upon thorough history taking parents revealed that 6 months back child was given dexamethasone injection intramuscularly in buttocks for respiratory problem by some local practitioner.



**Fig. 1**

Another 4 year old male child presented with similar lesions described above on each buttock since 4 months and he was also inadvertently injected with triamcinolone acetonide on buttocks for allergic episode. Both children were clinically diagnosed to have corticosteroid induced lipoatrophy.

Children were started treatment with 0.9% bacteriostatic normal saline intralesionally with help of 30 gauge insulin syringe injected at an angle of 45 degree. Around 1 ml of normal saline was given on each side along the dermal plane so as to fill the lesion completely. Lesions became tumid and swollen immediately and this effect lasted for few hour only. Treatment was repeated and assessed at an interval of 2 weeks and topical pimecrolomus was given in between to apply twice daily for correction of skin depigmentation.

After 15 days of first injection lesions were found to have decrease in depth as well as hypo-pigmentation and after third session lesions area matched approximately with the surrounding skin with respect to depth, colour and texture.[Fig. 2]



**Fig. 2**

## Discussion

Corticosteroids are one of the most frequently used weapons in the hands of dermatologists and this weapon is used in many forms locally and systemically. Different formulations like cream, ointments, foam, tablets and injections are used to achieve desired results. Besides injecting a steroid directly in the bloodstream, it can also be injected into abnormal skin with the aim of improving its appearance or reducing symptoms such as itch or pain or hypertrophy. The common preparations used for this purpose are triamcinolone acetonide and sometimes methylprednisolone acetate and the commonest indications are alopecia, keloids, scar and other hypertrophic conditions. But, depot preparations of these steroids are sometimes used as intramuscular injection also to achieve a constant plasma concentration for 1-4 weeks. Guidelines to use IM triamcinolone has been given for asthma patients,<sup>(4)</sup> but it is used rampantly by quacks and untrained physicians in rural practice in variety of unsolicited dermatological indications.

Corticosteroids slow down collagen synthesis by their anti-mitotic effects. Besides their ability to suppress leucocyte adherence, they have potent vasoconstrictor properties also.<sup>(5,6)</sup> While achieving the desired effects, many side effects come across such as capillary dilatation, hypo-pigmentation and subcutaneous fat atrophy. Lipoatrophy is more pronounced when triamcinolone is not injected in the deeper planes of gluteus muscles. One small study from Mayo clinic, USA found that some degree of lipoatrophy is seen in 62% of patients after intramuscular injection.<sup>(1)</sup>

On histopathological examinations of the corticosteroid induced lipoatrophy specimens, decrease in size and number of adipocytes are seen and they are surrounded by hyaline material.<sup>(8)</sup> These fat cells start resembling like their embryonic counterparts what we call involutinal fat.<sup>(8)</sup> Sometimes, macrophages are also seen to engulf adipocytes thereby becoming lipophages. Yellow-grey mucin positive granules are seen inside these lipophages. So the common pattern of post-injury response to fat tissue is characterized by macrophage infiltration of the fat lobules in variable numbers.<sup>(1)</sup>

The aim of treatment in lipoatrophy is first to rescue the ongoing damage of adipocytes and second is to fill the gap with natural or synthetic polymers. The best way to fill this gap is by autologous fat injection<sup>(9)</sup> and other synthetic options are poly-L-lactic acid and calcium hydroxyapatite.<sup>(10)</sup> These treatment options are expensive and need expertise for delivery. In 2005, Shumaker PR et al from San diego, USA demonstrated that normal saline infiltration offers a safe, tolerable, relatively rapid, and effective treatment for local, persistent corticosteroid-induced atrophy.<sup>(3)</sup> Samantha L and his co-workers from Washington also observed successful response of normal saline injection in a 51 year old lady having three plaques of lipoatrophy.<sup>(11)</sup>

Our patients are children of less than 6 years age group in which this therapy has been least studied till date. The alternative treatment options are inconvenient, expensive and less studies particularly in children. On the other hand, injection of bacteriostatic saline offers a convenient, cheap outpatient procedure for lipoatrophy. We recommend that injections should be given with 30 gauge needle, as it makes sure procedure to be virtually pain-free and therefore suits good for apprehensive children. The frequency of injection was weekly by Shumaker PR et al and monthly by Samantha L while it was fortnightly in our cases. A synergistic effect between time and saline injection is definitely possible and can be proven by further comparative studies. The exact mechanism how this saline injection is helpful is difficult to prove but it has been hypothesised that steroid crystals lying around the adipocytes are forced back into the suspension by injection of normal saline and from suspension, these crystals are recognized and cleared by natural defense of body.<sup>(12)</sup> Further studies are definitely needed to illuminate better mechanism of action and better understanding of optimal frequency and dosing.

## Conclusion

Localized lipoatrophy is a considerable cosmetic concern for patients himself and in case of children their parent. Many treatment modalities have been tried with variable results but none of them were as much cost effective as normal saline. Besides, it is an easy and day care procedure. This study helps in opening a new horizon for treating cases of localized lipoatrophy.

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