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# Effect of High-Dose Intramuscular Triamcinolone in Older Adults with Severe, Chronic Asthma

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**Abstract.** Life threatening asthma is a serious condition that is often difficult to treat. Often, despite maximal medical therapies, these patients remain functionally crippled. In addition, older patients are even more susceptible to asthma as they are less able to adapt to or tolerate the symptoms. In this paper we report the effectiveness of a new treatment regimen of high-dose intramuscular triamcinolone (360 mg) in 7 elderly patients with severe, chronic, steroid-dependent asthma. Each patient was given one intramuscular injection of 360 mg of triamcinolone (Kenalog) after maximizing traditional medicines. All 7 patients experienced resolution of their asthma symptoms within 1 week of receiving this injection. They showed marked functional improvement in their activities of daily living, and independence. Six of seven progressed from being homebound to walking, shopping, and grooming without restriction. All had a corresponding rise in peak expiratory flow rates ranging between 25 and 93%. In addition, all were able to stop taking their daily oral prednisone. Response durations ranged from 3 to 24 months. In the 6 patients who experienced relapse, all requested and received a second injection, with similar positive outcomes. Some experienced transient weakness and diabetes during the first week of the therapy but all elected to receive additional shots when they experienced break-through wheezing. Thus, we feel that high-dose intramuscular triamcinolone should be considered as a therapeutic option for a highly select group of older steroid-dependent asthma patients.

**Key words:** Asthma—Triamcinolone.

## Introduction

Asthma affects 7–10% of children and perhaps 5% of the adult population. Of all cases, 85% present before the age of 40. Adult onset is not unusual and

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**Table 1.** Patient characteristics

| Patient number | Age at onset of asthma | Age | Sex | Number of intubations |
|---|---|---|---|---|
| 1 | 43 | 58 | F | 3NI[a] |
| 2 | 51 | 60 | F | 4NI |
| 3 | 50 | 63 | M | 1NI |
| 4 | 50 | 63 | M | 5 |
| 5 | 53 | 59 | F | 2 |
| 6 | 62 | 67 | F | 2 |
| 7 | 40 | 56 | F | 0 |

[a] NI, near intubations

comprises 15% of all cases. Only 3% of cases present after age 60 [3, 4], and 1% after 70 [1]. Asthma that persists into adult life tends to worsen progressively; half of the deaths from asthma occur after the age of 50 [7, 8]. Unfortunately, little else is known about how asthma differs among children, adults, and elderly patients.

Steroids have long been known to produce a beneficial response in hyperreactive airway disease [2, 6, 9]. Given this proven efficacy and our recent success with high-dose triamcinolone acetonide in younger, steroid-dependent asthma patients [10, 11], we tried a similar regimen in 7 debilitated, older asthma patients. In this retrospective study, we report the effect of high-dose intramuscular triamcinolone in these 7 patients.

## Methods

### *Subjects*

During the past 4 years we have treated 7 steroid-dependent, adult-onset asthma patients over 55 years of age (Table 1) with high-dose (360 mg) triamcinolone acetonide injections. Patients presented to the pulmonary clinic at Montefiore Medical Center from 1988 through 1991. All had chronic, severe, steroid-dependent asthma. Despite maximized medical therapy with beta-2 agonist (nebulized and metered-dose inhaler MDI), oral theophylline, inhaled and oral steroids, the patients were functionally debilitated. They required help at home in at least one activity of daily living (ADL) as reported by family. All patients exhibited evidence of reversibility by peak flow improvement following beta-2 agonist use. They had no stigmata of other major illness, such as congestive heart failure or thyroid disease, both common in this age group [5, 12], which may have contributed to their disabling symptoms. All patients were informed about the experimental nature of this therapy. They perceived their quality of life to be so low that they felt that they had nothing to lose and agreed to the high-dose steroid therapy.

All but one (patient 3) attended our pulmonary clinic at 2–3 monthly intervals. The peak flow values were obtained by averaging peak flow values taken when the patients were at the clinic. Following the triamcinolone injections, average peak flow values were obtained in a similar manner. Patient 3 provided us with peak flow measurements he recorded while at home.

*Treatment*

All patients received a total of 360 mg intramuscular triamcinolone acetonide (Kenalog-40, E. R. Squibb and Sons, Princeton, New Jersey); half the dose was injected into each buttock. The injections were given only after the patients had been followed for 1–2 months, and when the asthma was judged clinically to be in its best treated state (i.e., injections were not given when patients were experiencing an asthma exacerbation). Following the injections, all asthma medications—including oral steroids—were tapered off, except for the steroid inhaler which was continued at its normal maintenance dose. Repeat injections were given only when patients developed disabling symptoms due to chronic asthma. Acute asthma exacerbations were managed in the conventional manner with beta-2 agonists and steroids.

The 5 female and 2 male patients were all nonsmokers. Ages ranged from 58 to 67; in all cases the onset of asthma occurred after age 40. All patients had severe, debilitating asthma; all but one (patient 7) had a history of life-threatening attacks.

Six of the seven patients had been working and living independent lives prior to the rapid onset of progressively worsening asthma. The sixth patient (patient 3) was able to work with difficulty. All had exacerbation of their asthma symptoms at night.

## Results

The response of these patients to high-dose (360 mg) triamcinolone injections is summarized in Table 2. All reported complete resolution of their symptoms, reflected physiologically by a marked rise (25–93%) in their peak expiratory flow rates (PEFR). In addition, exercise tolerance improved markedly in all patients, allowing them to engage in activities that had previously been impossible since the onset of their asthma. Six of seven improved from being homebound (dependent on people to shop and cook for them) to being independent in the activities of daily living. One woman reported walking 1–2 miles per day after treatment. One patient returned to his daily 20 minute exercise program. The daily oral steroid dose was tapered over a week to zero in all cases, immediately after the injection. The improvement lasted from 3 to 24 months. Four patients have had remissions ranging from 11 to 24 months without any signs of asthma. These remissions are longer than those we have observed in younger patients [11]. All patients, except patient 3, have experienced breakthrough asthma that required additional injections of triamcinolone. Patient 1 has been given 3 injections, each of the first 2 lasting 12 months each. Patient 2 had a 24-month response to her first injection, a 12 month response to her second, and has just received her third injection. Patient 4 has received 3 injections with 12- and 14-month responses to the first 2 injections. Finally, patient 5 had a 23-month response to her first injection before experiencing recurrent wheezing that required increasing her maintenance dose of steroid inhaler and restarting her oral steroids and beta-2 agonists. She has recently received her second injection. Cases 6 and 7 had shorter responses than the others: 10 and 3 months, respectively (see Table 2). Case 3 has done well for over 1 year after receiving his first injection.

Although 6 of these patients experienced long-term responses, case 7 had a 3-month remission before being hospitalized for acute asthma. She required

**Table 2.** Response characteristics to high dose triamcinolone

| Patient number | Best peak flow (L/min) | | Daily prednisone dose (mg) | | Mobility | | Response |
|---|---|---|---|---|---|---|---|
| | Before TRIA[a] | After TRIA[b] | Before TRIA | After TRIA | Before TRIA | After TRIA | Duration in months between injections |
| 1 | 360 | 450 (25%) | 25 | 0 | Homebound | Independent | 12, 12 |
| 2 | 300 | 420 (40%) | 20 | 0 | Chronic dyspnea<br>Wheezing | Walks 10 blocks, limited by muscle fatigue | 24, 12 |
| 3 | 550 | 710 (29%) | 20 | 0 | Low exercise tolerance<br>Chronic fatigue<br>Lifestyle: controlled on medications | Exercises 20 min/day<br>No limits of activity | 11 |
| 4 | 195 | 300 (54%) | 30 | 0 | Constant wheezing<br>Hosp 150 days/yr<br>1/2 Block dyspnea | Walks 10 blocks<br>Shops for self | 12, 11 |
| 5 | 150 | 260 (73%) | 10 | 0 | Constant wheezing<br>Afraid of walking up<br>Unable to breathe | Walks 1–2 miles<br>Shops for self<br>Undisturbed sleep | 23 |
| 6 | 150 | 200 (33%) | 20 | 0 | Afraid to be without aerosol<br>Homebound<br>Ponders suicide | Walks 8 h<br>Feels like living<br>Wants to work | 10 |
| 7 | 160 | 300 (93%) | 20 | 0 | Unable to climb 1 flight<br>Walks only 2 blocks<br>Sleepless nights | Climbs 4 flights<br>Unlimited walking<br>Uninterrupted sleep | 3 |

[a] TRIA, triamcinolone

[b] The percentage increase in PEFR is shown in parentheses

intubation during a second hospitalization 5 months after her last injection. This patient has had a more severe relapse than the other patients who exhibited only mild wheezing, compared to their pretriamcinolone symptomatology. This case is in contrast to the mild relapses experienced by cases 1, 2, 4, and 5; these were easily controlled by increasing the dose of inhaled steroids or adding a beta-2 agonist. Injections were repeated only when asthma became severe. Case 7's shorter duration response remains to be explained. She did not have a history of life-threatening asthma. Unlike the other patients, she was never intubated prior to the injection. She had severe steroid dependence and a large functional deficit. Nevertheless she experienced 3 months of symptomatic relief.

The treatment was associated with side effects in this group of elderly patients. One patient had a 2-month period of hyperglycemia that required insulin, following the triamcinolone injection. Five of seven patients lost weight. There were minor complications including transient weakness (4/7); worsening cushingoid facies (4/7); and muscle cramps (2/7).

## Discussion

Some elderly patients with severe, chronic, life-threatening asthma, despite adequate therapy with inhaled and oral steroids, beta-agonists, and theophylline, continue to be severely disabled. In this retrospective study, 7 such patients were treated with high-dose intramuscular triamcinolone (360 mg) injections. Following the injection, PEFRs improved, long remissions occurred, and the previously disabled patients were able to return to productive lives. Subsequent injections provided responses similar to the first. In most of these cases, durations of responses were longer than those we have observed in younger patients.[11]

Elderly patients with asthma often have more difficulty coping with their disease, in part because they have less functional reserve. In the mature adult population, the functional loss resulting from chronic respiratory compromise may be even more detrimental than the occasional occurrence of a severe exacerbation. Patients in this age group are difficult to treat for chronic asthma because of their increased susceptibility to side effects caused by conventional chronic therapy. Following treatment with triamcinolone injections, all patients had a marked reduction in the need for other asthma medications.

One should always be concerned when using large doses of steroids in the older population because of the high incidence of side effects, including diabetes, osteoporosis, cataracts, psychosis, and myopathy. While the specific side effects of oral steroids versus intramuscular triamcinolone have yet to be formally studied, it should be noted that the total yearly dose of steroids in our study is much less with this treatment than with oral steroids (a 360-mg triamcinolone injection vs 10–20 mg oral prednisone daily). Although our 7 patients experienced side effects following the large intramuscular dose of triamcinolone, patients who required further treatment opted for repeat injections on subsequent occasions. One patient who developed diabetes requiring insulin felt the

price was extremely small, given her new ability to breathe normally. Even patient 7, who experienced only a 3-month disease-free status before requiring hospitalization and intubation, requested a second injection.

In older patients with severe asthma, treatment with high-dose injections of triamcinolone may result in dramatic improvement in quality of life, reduction of asthma-associated symptoms, and increased best PEFR. Remissions have lasted as long as 24 months. Despite side effects, high-dose triamcinolone provides a smaller dose of steroid per year than oral prednisone and should be considered as an alternative therapy if conventional therapy with inhaled and oral steroids is not effective in relieving the disabling symptoms of asthma. Patients receiving such therapy need to be closely monitored for side effects. Prospective studies are required to evaluate the role of this treatment for adult onset asthma patients who suffer severe, chronic, disabling asthma despite oral steroid therapy.

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