CASE REPORT

Aerosol Corticosteroid Induced Purpura

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INTRODUCTION

Aerosol corticosteroids are increasingly being advocated for management of responsive cases of obstructive pulmonary disease. With trends in both increased utilization and increased dose of aerosol corticosteroids there are increasing reports of toxicity, including purpura.[1-5] Purpura is a manifestation of several diseases including systemic vasculitis, infections such as meningococcemia and measles, drug use, and senility. Inflammation of purpuric lesions does not occur in senile purpura, nor in corticosteroid-induced purpura. The existence of purpura suggests weakening of skin tissue secondary to the breakdown of collagen.[6] We report a case of aerosol corticosteroid-induced purpura and review the literature on this recently recognized complication of aerosol corticosteroids.

CASE

A 74 year-old male was admitted to hospital with a chief complaint of shortness of breath, accompanied by fever, chills, rigors, sweats and pleuritic right-sided chest pain. The history of his present illness included longstanding bronchitis/emphysema, for which he had received home oxygen since 1986. He was a greater than 100 pack-year smoker but "quit" in 1987, and now smokes only occasionally. He also had a history of alcohol abuse. His past medical history was extensive and included kyphosis, Duke's C carcinoma with surgical resection, cataracts and peptic ulcer disease. Review of systems was remarkable only for his dyspnea. On examination, the patient was thin and was dyspneic at rest. His blood pressure was 130/80 mmHg, temperature 38.3°C, heart rate 130 beats per minute, and respiratory rate 30/minute. Chest examination revealed crackles over the right lower lobe, and he had modest pedal edema. Non palpable purpuric lesions were evident on forearms. The remainder of the physical exam was unremarkable. According to the patient, his medications at home included salbutamol metered dose inhaler (MDI), budesonide MDI, theophylline, and furosemide. He indicated that he used his MDIs seven times daily (q3h while awake) administering two puffs of each MDI for each dose. Blood gases on admission were PO_2 59 mmHg, pH 7.49, PCO_2 37 mmHg and HCO_3 28 mmol/L. Serum chemistries were remarkable for an elevated glucose of 8.3 mmol/L, serum albumin 30 g/L, total bilirubin 20 μmol/L and theophylline serum concentration of 28 μmol/L (N 55-110). Prothrombin time and partial thromboplastin time were 9.6 and 29 seconds respectively. Platelet count was normal. White blood cell count was elevated at 13.6 x 10^9/L. The patient was diagnosed as having an exacerbation of COPD and was prescribed amoxicillin, furosemide, heparin, ipratropium and salbutamol MDIs and beclomethasone MDI 250 mcg qid. When specifically asked, regarding the purpuric lesions on his forearms, he indicated that these had developed one month prior to admission, and approximately three months after increasing his budesonide from the prescribed daily dose of 800 mcg to 2800 mcg per day, (2 puffs q3h). He also reported that the higher dose made him "feel better" than the lower dose. The possibility of corticosteroid-induced purpura was suspected, and the patient was strongly encouraged to comply with the prescribed regimen. Aside from some minor psychic changes, the patient encountered no difficulties with the lower dose. Follow up one month after discharge revealed that the purpuric rash was still present, although it had faded somewhat.

DISCUSSION

Aerosol corticosteroid induced purpura is infrequently cited as a complication of aerosol corticosteroid

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Acknowledgements: The authors would like to acknowledge the secretarial assistance of Ms. G. Campbell.

use.[5,6] The occurrence of oral and topical corticosteroid induced purpura is a comparatively well known phenomenon, believed to be caused by the atrophy of collagen leading to rupture of capillaries in the skin. Though these lesions resemble senile purpura, corticosteroid induced purpura occurs usually only on the legs below the knees and the fronts of the forearms.[7]

A single case report of purpura associated with aerosolized corticosteroids has been reported to date. This involved a 54 year-old female asthmatic who, after 18 months on high dose inhaled beclomethasone (750 mcg twice daily), developed persistent and extensive bruising on her arms and legs. She received severe full thickness lacerations to the purpuric and atrophic areas of skin which subsequently required grafting. She underwent adrenal function tests and was found to have borderline adrenal impairment. The reporting physician felt that the purpura was secondary to the use of high dose aerosol corticosteroids.[6] Recently, studies have identified that a relationship does exist between the development of purpura and depressed morning serum cortisol measurements. (Personal communication Dr. J.H. Toogood).

A recent study assessed the effect of high dose aerosol corticosteroids on the thickness of skin.[5] The investigators found that those patients receiving oral prednisolone or high dose aerosol corticosteroids had significantly thinner skin (28-33% and 15-19% respectively) than those receiving low dose aerosol corticosteroids and controls. Furthermore, the occurrence of purpura was significantly greater in patients taking oral prednisolone (12/15) and in those receiving high dose aerosol corticosteroids (10/21) than in the control group (2/17). It was concluded that skin thinning and purpura represent evidence of systemic effects of high dose aerosol corticosteroids.[5]

The risk factors associated with systemic effects of aerosol corticosteroids include increased dose ($\geq$1500 mcg beclomethasone) and duration of treatment.[5] Whether the use of spacer affects risk is unknown.[8] It appears that both budesonide in this case and beclomethasone[5,6] in other cases may produce purpura.

Pharmacists should be aware that high dose aerosol corticosteroids may cause purpura, as well as other systemic adverse effects including skin thinning, adrenocorticoid suppression, decreased insulin sensitivity, behaviourial changes and possibly posterior subcapsular cataracts.[2,3,9] Purpura is a visible sign of corticosteroid toxicity, suggesting other less easily detected effects may also be occurring. Assessment of compliance is essential to identify excessive use of inhaled corticosteroids, since higher doses increase the risk for systemic adverse effects.

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