Steroid side effects

Although deleterious side effects of steroids are more common with prolonged administration [1], some can occur even with short treatment courses. Some evidence suggests that low-dose glucocorticoids (≤10mg/d of prednisolone or prednisone equivalent) for rheumatoid arthritis does not increase osteoporotic fractures, blood pressure, cardiovascular disease, or peptic ulcers [2], but weight gain and skin changes are common. Possible side effects include [3] [4]:

● cardiovascular and renal

○ hypertension

○ sodium and water retention

○ hypokalemic alkalosis

● CNS

○ progressive multifocal leukoencephalopathy (PML)

○ mental agitation or “steroid psychosis”

○ spinal cord compression from spinal epidural lipomatosis: rare

○ pseudotumor cerebri, or Idiopathic intracranial hypertension (IIH)

● endocrine

○ caution: because of the growth suppressant effect in children, daily glucocorticoid dosing over prolonged periods should be reserved for the most urgent indications

○ secondary amenorrhea

○ suppression of hypothalamic-pituitary-adrenal axis: reduces endogenous steroid production →

risk of adrenal insufficiency with steroid withdrawal

○ Cushingoid features with prolonged usage (iatrogenic Cushing’s syndrome): obesity, hypertension, hirsutism…

● GI: risk increased only with steroid therapy > 3 weeks duration and regimens of prednisone > 400–1000 mg/d or dexamethasone > 40 mg/d [5]

○ gastritis and steroid ulcers: incidence lowered with the use of antacids and/or H2 antagonists (e.g. cimetidine, ranitidine…)

○ pancreatitis

○ intestinal or sigmoid diverticular perforation [6]: incidence ≈ 0.7%. Since steroids may mask signs of peritonitis, this should be considered in patients on steroids with abdominal discomfort, especially in the elderly and those with a history of diverticular disease. Abdominal X-ray usually shows free intraperitoneal air

● inhibition of fibroblasts ○ impaired wound healing or a wound breakdown ○ subcutaneous tissue atrophy

● metabolic ○ glucose intolerance (diabetes) and disturbance of nitrogen metabolism ○ hyperosmolar nonketotic coma ○ hyperlipidemia ○ tend to increase BUN as a result of protein catabolism

● ophthalmologic ○ posterior subcapsular cataracts ○ glaucoma

● musculoskeletal

○ avascular necrosis (AVN) of the hip or other bones: usually with prolonged administration →cushingoid habitus and increased marrow fat within the bone13 (prednisone 60 mg/d for several months is probably the minimum necessary dose, whereas 20 mg/d for several months will probably not producing AVN). Many cases blamed on steroids may instead be due to alcohol use, cigarette smoking, liver disease, underlying vascular inflammation...

○ osteoporosis: may predispose to vertebral compression fractures which occur in 30–50% of patients on prolonged glucocorticoids. Steroid-induced bone loss may be reversed with cyclical administration of etidronate in 4 cycles of 400 mg/d ✖ 14 days followed by 76 days of oral calcium supplements of 500 mg/d (not proven to reduce the rate of VB fractures)

○ muscle weakness (steroid myopathy): often worse in proximal muscles

● infectious

○ immunosuppression: with possible superinfection, especially fungal, parasitic

○ possible reactivation of TB, chickenpox

● hematologic

○ hypercoagulopathy from inhibition of tissue plasminogen activator

○ steroids cause emargination of white blood cells, which may artifactually elevate the WBC count even in the absence of infection

● miscellaneous

○ hiccups: may respond to chlorpromazine (Thorazine®) 25–50 mg PO TID-QID ✖ 2–3 days (if symptoms persist, give 25–50 mg IM)

○ steroids readily cross the placenta, and fetal adrenal hypoplasia may occur with the administration of large doses during pregnancy

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DEXA, however, has many systemic side effects and may interact negatively with glioma therapy.

The long-term side effects of dexamethasone are well known, including Cushingnoid appearance, truncal obesity, lymphopenia, immunosuppression, hyperglycemia, steroid myopathy, fluid retention, visual blurring, tremor, mood/behavioral changes (including psychosis), osteoporosis, and cerebral atrophy [7].

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