Prednisone

Prednisone is a synthetic corticosteroid drug that is particularly effective as an immunosuppressant drug. It is used to treat certain inflammatory diseases (such as moderate allergic reactions), some autoimmune diseases, and (at higher doses) some types of cancer, but it has significant adverse effects.

Inhibition of RTK pathways in cancer triggers an adaptive response that promotes therapeutic resistance. Because the adaptive response is multifaceted, the optimal approach to blunting it remains undetermined. TNF upregulation is a biologically significant response to EGFR inhibition in NSCLC. Gong et al. compared a specific TNF inhibitor (etanercept) to thalidomide and prednisone, two drugs that block TNF and also other inflammatory pathways. Prednisone is significantly more effective in suppressing EGFR inhibition-induced inflammatory signals. Remarkably, prednisone induces a shutdown of bypass RTK signaling and inhibits key resistance signals such as STAT3, YAP and TNF-NF-κB. Combined with EGFR inhibition, prednisone is significantly superior to etanercept or thalidomide in durably suppressing tumor growth in multiple mouse models, indicating that a broad suppression of adaptive signals is more effective than blocking a single component. They identify prednisone as a drug that can effectively inhibit adaptive resistance with acceptable toxicity in NSCLC and other cancers [1)]

Chronic inflammatory demyelinating polyradiculoneuropathy (CIDP) is a progressive or relapsing and remitting paralysing illness probably due to an autoimmune response which should benefit from corticosteroids. Non-randomised studies suggest that corticosteroids are beneficial. Two commonly used corticosteroids are prednisone and prednisolone. Both are usually given as oral tablets. Prednisone is converted into prednisolone in the liver so that the effect of the two drugs is usually the same. Another corticosteroid, called dexamethasone, is more potent and is used in smaller doses.

Hughes et al in the Cochrane Database Syst Rev.from 2017 are very uncertain about the effects of oral prednisone compared with no treatment, because the quality of evidence from the only RCT that exists is very low. Nevertheless, corticosteroids are commonly used in practice, supported by very low-quality evidence from observational studies. They also know from observational studies that corticosteroids carry the long-term risk of serious side effects. The efficacy of high-dose monthly oral dexamethasone is probably little different from that of daily standard-dose oral prednisolone. Most side effects occurred with similar frequencies in both groups, but with high-dose monthly oral dexamethasone moon facies is probably less common and sleeplessness may be less common than with oral prednisolone. We need further research to identify factors that predict response [2)]

Very low quality evidence from one small, randomised trial did not show a statistically significant benefit from oral prednisone compared with no treatment. Nevertheless, corticosteroids are commonly used in practice. According to moderate quality evidence from one RCT, the efficacy of high-dose monthly oral dexamethasone was not statistically different from that of daily standard-dose

oral prednisolone. Most adverse events occurred with similar frequencies in both groups, but sleeplessness and moon facies were significantly less common with monthly dexamethasone. Further research is needed to identify factors which predict response [3].

In a reported case, administration of omeprazole, was temporally associated with the clinical relapse of pemphigus in a 44-year-old woman whose condition had been stabilized with a fixed dose of prednisone, suggesting the possibility of a drug interaction. This placebo-controlled, randomized, double-blind, three-period crossover study was conducted to evaluate and compare the pharmacokinetics of prednisolone after a single dose of prednisone given during multi-dose administration of lansoprazole or omeprazole. Lansoprazole (30 mg), omeprazole (40 mg), or placebo was administered once daily under fasted conditions for 7 days to healthy male volunteers. On the seventh day, a single dose of prednisone (40 mg) was administered concomitantly with the study medication, and plasma prednisolone concentrations were measured by high-performance liquid chromatography for 24 hours thereafter. Two weeks separated the first doses of each study period. Eighteen volunteers entered the study; pharmacokinetic data were evaluable for 15 participants. Safety data were evaluable for 16 participants in the lansoprazole/prednisone group; 17 in the omeprazole/ prednisone group; and 17 in the placebo/prednisone group. The pharmacokinetic parameters for prednisolone, including the maximum observed plasma concentration (Cmax), time to maximum plasma concentration (tmax), terminal-phase half-life (t1/2), and area under the concentration-time curve, were comparable for the three regimens. Adverse events (AEs) rated as possibly or probably drug related were reported by 50%, 24%, and 47% for subjects in the lansoprazole, omeprazole, and placebo treatment groups, respectively. Headache was the most common drug-related AE. No serious AEs were reported, and no subject withdrew from the study because of an AE. Concomitant administration of lansoprazole or omeprazole does not affect the absorption, biotransformation, or disposition of a single dose of prednisone. All three treatment regimens were well tolerated [4].

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