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[Intervention Review]

Corticosteroids for the treatment of Kawasaki disease in children

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ABSTRACT

Background

Kawasaki disease (KD), or mucocutaneous syndrome, is the leading cause of childhood-acquired heart disease in high-income countries. There is much controversy on how best to treat children with KD and in particular who may benefit from additional treatment beyond the standard intravenous immunoglobulin (IVIG) and aspirin, such as the addition of corticosteroids. This is an update of the review first published in 2017.

Objectives

To assess the impact of corticosteroid use on the incidence of coronary artery abnormalities in KD as either first-line or second-line treatment.

Search methods

The Cochrane Vascular Information Specialist searched the Cochrane Vascular Specialised Register, CENTRAL, MEDLINE, Embase, CINAHL and two trials registers to 8 February 2021. We searched the reference lists of relevant articles for additional studies.

Selection criteria

We selected randomised controlled trials involving children with all severities of KD who were treated with corticosteroids, including different types of corticosteroids, different durations of treatment, and where corticosteroids were used alone or in conjunction with other accepted KD treatments. We included trials using corticosteroids for both first- and second-line treatment.

Data collection and analysis

Two review authors independently selected studies, assessed study quality and extracted data using standard Cochrane methods. We performed fixed-effect model meta-analyses with odds ratios (ORs) or mean difference (MD) with 95% confidence intervals (CIs). We used a random-effects model when there was heterogeneity. We assessed the certainty of the evidence using GRADE. The outcomes of interest were incidence of coronary artery abnormalities, serious adverse events, mortality, duration of acute symptoms (such as fever), time for laboratory parameters to normalise, length of hospital stay and longer-term coronary morbidity.

Main results

This update identified one new study, therefore the analysis included eight trials consisting of 1877 participants. Seven trials investigated the use of corticosteroids in first-line treatment and one investigated second-line treatment. The trials were all of good methodological quality.

On pooled analysis, corticosteroid treatment reduced the subsequent occurrence of coronary artery abnormalities (OR 0.32, 95% CI 0.14 to 0.75; 8 studies, 986 participants; moderate-certainty evidence), without resultant serious adverse events (0 events; 6 studies, 737 participants; moderate-certainty) and mortality (0 events; 8 studies, 1075 participants; moderate-certainty evidence). In addition, corticosteroids reduced the duration of fever (MD −1.34 days, 95% CI −2.24 to -0.45; 3 studies, 290 participants; low-certainty evidence), time for laboratory parameters (erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP)) to normalise (MD −2.80 days, 95% CI −4.38 to −1.22; 1 study, 178 participants; moderate-certainty evidence), and length of hospital stay (MD −1.01 days, 95% CI −1.72 to −0.30; 2 studies, 119 participants; moderate-certainty evidence). None of the included studies reported long-term (greater than one year after disease onset) coronary morbidity.

Authors' conclusions

Moderate-certainty evidence shows that use of steroids in the acute phase of KD can be associated with reduced coronary artery abnormalities, reduced inflammatory markers and shorter duration of hospital stay when compared to no corticosteroids. There were no serious adverse events or deaths reported with or without corticosteroid use. Low-certainty evidence shows use of corticosteroids can reduce duration of clinical symptoms (fever and rash). None of the included studies reported on long-term (greater than one year after disease onset) coronary morbidity. Evidence presented in this systematic review agrees with current clinical guidelines on the use of corticosteroids in the first-line treatment in KD.

PLAIN LANGUAGE SUMMARY

Using corticosteroids to treat Kawasaki disease

Key message

Corticosteroids appear to reduce the risk of heart problems after Kawasaki disease without causing any important side effects. They also reduce the length of symptoms (fever and rash), length of hospital stay, and blood markers associated with being unwell.

What is Kawasaki disease and how is it treated?

Kawasaki disease is an inflammation of the blood vessels. Standard medicines to treat Kawasaki disease are intravenous immunoglobulin (IVIG) and aspirin. This treatment is usually effective, but it does not work for all children. We currently have a limited understanding of Kawasaki disease and how best to manage it. This is important as one of the long-term consequences can involve the heart, putting the children with the disease at higher risk of life-shortening outcomes.

What did we do?

We searched for randomised controlled studies that treated children with Kawasaki disease using medicines known as corticosteroids, to see if they reduced the chance of future heart problems. We also investigated the effect on the duration of fever, signs of infection in the blood, and the number of days spent in hospital. In randomised controlled studies, the treatments or tests people receive are decided at random and these usually give the most reliable evidence about treatment effects.

What did we find?

We found eight studies involving 1877 participants, which compared the use of corticosteroids with no corticosteroids in children with Kawasaki disease. Combining the results from these studies showed that heart problems were reduced after corticosteroid treatment. There were no serious side effects or deaths reported in the corticosteroid treatment groups or the no corticosteroid treatment groups. Blood markers that indicate illness were reduced and children had shorter stays in hospital when treated with corticosteroids. Symptoms of Kawasaki disease (fever and rash) lasted for a shorter time after corticosteroid treatment. None of the studies reported on long-term (more than one year after disease onset) heart problems (coronary morbidity), which can be associated with Kawasaki disease.

How certain are we in the evidence?

Evidence was of moderate certainty for serious side effects and deaths, the risk of future heart problems, blood markers and length of hospital stay. This means that we are moderately confident that the true effect is close to that estimated in this review. Evidence was considered low certainty for the duration of clinical symptoms (fever and rash). This means our confidence in the effect estimate is limited and this was because of how these symptoms were measured and reported.

How up-to-date is this evidence?

This Cochrane Review updates our previous evidence. The evidence is current to February 2021.