Cochrane Database of Systematic Reviews - - Cochrane Review

Omegaâ€•3 fatty acid supplementation for cystic fibrosis

Code: CD002201 **Year:** 2020 **Date:** 2011 - updated: 1 APR 2020 **Author:** Oliver C

Study design (if review, criteria of inclusion for studies)

Randomised controlled trials in people with cystic fibrosis comparing omega-3 fatty acid supplements with placebo.

List of included studies (5)

Hanssens 2016; Henderson 1994; Keen 2010; Lawrence 1993; Panchaud 2006

Participants

People with CF, of any age and severity, diagnosed clinically and by sweat or genetic testing.

Interventions

Omega-3 fatty acids

Outcome measures

Adverse events; Biochemical markers of essential fatty acid status (B4/B5 ratio); Biochemical markers of essential fatty acid status (B4/B5 ratio).; Biochemical markers of essential fatty acid status (n6/n3); Changes in biochemical markers of essential fatty acid status; Clinical variables; Lung function

Main results

The searches identified 23 studies; five studies with 106 participants (children and adults) were included; duration of studies and interventions differed. Two studies compared omegaâ€•3 fatty acids to olive oil for six weeks; one study compared omegaâ€•3 fatty acids and omegaâ€•6 fatty acids to control capsules (customised fatty acid blends) for three months; one study compared a liquid dietary supplement containing omegaâ€•3 fatty acids to one without for six months; and one study compared omegaâ€•3 fatty acids to a placebo for 12 months. Three studies had a low risk of bias for randomisation, but the risk was unclear in the remaining two studies; all studies had an unclear risk of bias for allocation concealment. Three of the studies adequately blinded participants; the risk of bias for selective reporting was high in one study and unclear for four studies. Two studies reported the number of respiratory exacerbations. At three months, one study (43 participants) reported no change in antibiotic usage. At 12 months the second study (15 participants) reported a reduction in the number of pulmonary exacerbations and cumulative antibiotic days in the supplement group compared to the previous year (no data for the control group); very lowâ€•quality evidence means we are unsure whether supplementation has any effect on this outcome. With regards to adverse events, one sixâ€•week study (12 participants) reported no difference in diarrhoea between omegaâ€•3 or placebo capsules; the very lowâ€•quality evidence means we are unsure if supplementation has any effect on this outcome. Additionally, one study reported an increase in steatorrhoea requiring participants to increase their daily dose of pancreatic enzymes, but three studies had already increased pancreatic enzyme dose at study begin so as to reduce the incidence of steatorrhoea. One study (43 participants) reported stomach pains at three months (treatment or control group not specified). One sixâ€•week study (19 participants) reported three asthma exacerbations leading to exclusion of participants since corticosteroid treatment could affect affect essential fatty acid metabolism. Four studies reported lung function. One sixâ€•week study (19 participants) reported an increase in forced expiratory volume in one second (FEV1) (L) and forced vital capacity (FVC) (L), but the very lowâ€•quality evidence means we are unsure if supplementation has any effect on lung function. The remaining studies did not report any difference in lung function at three months (unit of measurement not specified) or at six months and one year (FEV1 % predicted and FVC % predicted). No deaths were reported in any of the five studies. Four studies reported clinical variables. One study reported an increase in Schwachman score and weight alongside a reduction in sputum volume with supplementation compared to placebo at three months (data not analysable). However, three studies reported no differences in either weight at six weeks, in body mass index (BMI) standard deviation (SD) score at six months (very lowâ€•quality evidence) or BMI Z score at 12 months. Three studies reported biochemical markers of fatty acid status. One study showed an increase from baseline in both EPA and DHA content of serum phospholipids in the omegaâ€•3 group compared to placebo at three months and also a significant decrease in nâ€•6/nâ€•3 ratio in the supplement group compared to placebo; since the quality of the evidence is very low we are not certain that these changes are due to supplementation. One sixâ€•month crossâ€•over study showed a higher EPA content of the neutrophil membrane in the supplement group compared to the placebo group, but, no difference in DHA membrane concentration. Furthermore, the leukotriene B4 to leukotriene B5 ratio was lower at six months in the omegaâ€•3 group compared to placebo. A oneâ€•year study reported a greater increase in the essential fatty acid profile and a decrease in AA levels in the treatment arm compared to placebo.

Authors' conclusions

This review found that regular omegaâ€•3 supplements may provide some limited benefits for people with cystic fibrosis with relatively few adverse effects: however, the quality of the evidence across all outcomes was very low. The current evidence is insufficient to draw firm conclusions or recommend routine use of these supplements in people with cystic fibrosis. A large, longâ€•term, multicentre, randomised controlled study is needed to determine any significant therapeutic effect and to assess the influence of disease severity, dosage and duration of treatment. Future researchers should note the need for additional pancreatic enzymes when providing omegaâ€•3 supplementation or olive oil placebo capsules. More research is required to determine the exact dose of pancreatic enzyme required.

https://doi.org/10.1002/14651858.CD002201.pub6

See also

Watson H, Stackhouse C. Omegaâ€•3 fatty acid supplementation for cystic fibrosis. Cochrane Database of Systematic Reviews 2020, Issue 4. Art. No.: CD002201. DOI: 10.1002/14651858.CD002201.pub6

Keywords

omega-3; Fish Oils; non pharmacological intervention - diet; Supplementation; essential fatty acids; Food;