Is there an association between a high fat diet and depression: systemic review of observational studies?

Abstract

Background: There are many studies on association between some biological factors and depression. However there are not too many studies showing association between depression and fatty diet. The aim of this study is to provide a systemic review on association between depression and fatty diet.

Methods: the systemic review focused on studies that link diet and depression with emphasis on fatty diet and depression as the outcome. Inclusion criteria for the review includes one quantitative assessed dietary variable in the analysis with depression or depressive symptoms as outcome.

Results: from the reviewed prospective studies, diet high in fat content (TFA) have high probability for depressive symptoms while diet rich in Omega 3 fatty acid and MUFA such as olive oil and fish have a weak inverse association.

Conclusion: the relationship between fatty acids and depression has been examined in observational and experimental studies. Both studies indicate that depressive symptoms are unlikely in individuals that have lower concentration of ω-3 fatty acid and more likely in those with higher concentration of ω-6 fatty acid.

Introduction

Depression affects people in all community worldwide and significantly contributes to global burden of disease. Estimate of more than 350 million people are affected by depression. It is the leading cause of disability worldwide. Diet is an important biophysical factor that plays a central role in the overall health of an individual. Studies have shown that healthier eating pattern is associated with better health outcomes including mental health. From preventive health perspective findings, association between fatty diet and depression can be applied in evidence-based primary care of depressive symptoms. Recently there is emerging evidence that links nutrition pattern to risk of depression. Depression relates to biomarkers of short and long term polyunsaturated fatty acid intake. There are so many studies on nutrition and depressive symptoms. However there are no enough data on association between high fat diet and depression. The aim of this review is to assess if there is relationship between fat content of the diet and depression.

Materials and methods

The study design comprises of cohort studies cross sectional designs and case-control study published within ten years of the review. Ten databases were searched for observational studies on the association between fatty diet and depression. The search was limited to English Language report. Search term was diet, nutrition, ω-3 fatty acid, PUFA, MUFA and depression/depressive symptoms. Inclusion criteria for the review includes one quantitative assessed dietary variable in the analysis with depression or depressive symptoms as outcome. The study must have a validated tool for dietary assessment such as food frequency questionnaire with at least 35 validated items. Assessment of depression should be based on a standard measurement such as physician diagnosis or initiation of anti-depressant etc. Some selected articles and reviews in the references were tracked to see if they met the inclusion criteria. For articles included in the review, the following information were obtained; the author’s name and publication year, setting and study design, data analysis, subject characteristics (age and sex), dietary assessment instrument, depression assessment tool, adjusted variable (if any) and the main findings.

Results

<table>
<thead>
<tr>
<th>Author</th>
<th>Study Design</th>
<th>Subjects</th>
<th>Diet Assessment</th>
<th>Depression Assessment</th>
<th>Adjustment of potential confounders</th>
<th>Results</th>
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<tr>
<td>Akbaraly TN et al.</td>
<td>prospective Cohort</td>
<td>3486 London based office staff ages 35-55 years working in civil service departments</td>
<td>Food Frequency Questionnaire based on US Nurses’ Health Study</td>
<td>Center of Epidemiologic studies. Depression scale (CES-D)</td>
<td>In the fully adjusted model, age, gender, energy intake, marital status, physical activity, pre-existing medical conditions, antidepressant drugs and cognitive functions were all adjusted for.</td>
<td>Participants with high intake of whole food were less likely to report CES–D depression: OR = 0.64 (95% CI 0.49–0.83) in contrary to those with high intake of processed food that have high odds of depression OR = 1.58 (95% CI 1.11–2.23).</td>
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<td>Brinkworth et al.</td>
<td>Prospective cohort study</td>
<td>118 obese Australian women with ages between 24-64years were randomized to low carbohydrate and low fat diet. Participants on Low fat diet were restricted to dietary profile that have less than 8% saturated fat.</td>
<td>Depression inventory was used to assess outcome (depression). Improvement in mood including depression were observed in both LC and LF group but long term effect of this result was only sustained in LF group not in the LC group.</td>
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<td>Port et al.</td>
<td>Gazel Cohort study</td>
<td>An ongoing cohort study set up in 1989 with employees of France natural gas and electricity company. Initially constitute of 15,011 men and 5,614 women ages 35-50. The food frequency Questionnaires was used to ascertain dietary assessment. Center of Epidemiologic studies Depression scale (CES-D) Covariates such as age were adjusted for. Western diet 1.36(1.18-1.57) and snacking 1.49(1.29-1.72) are more likely to have high CES-D score compared to healthy diet 0.69(0.60-0.80)</td>
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<td>Lucas et al.</td>
<td>Prospective study</td>
<td>54,632 Us women from the Nurse's health study ages 50-77 years who have no depressive symptoms at baseline were follow up for 10 years. The validated food frequency questionnaire was use as dietary assessment tool. Depression was assessed based on physician diagnosis of depression and regular use of anti-depressant. The following covariate were adjusted for; age, time interval, hormonal status, race, smoking status, alcohol, physical activity, ALA( a-linoleic acid) 0.99(0.88, 1.15) intake was associated with risk of depression however there is no protective effect from fish consumption omega 3 fatty acid intake. This could be due to limitations in assessing individual food components.</td>
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<td>Sanchez et al.</td>
<td>The Sun Project: a prospective study among mediterrian population</td>
<td>12,059 Spanish university graduates with mean age of 37.5 years were followed for 11 years. 136 validated food frequency questionnaire with was used to estimate the fat content in food. Depression was assessed based on physician diagnosis and initiation of antidepressants. The following covariates were adjusted for; age , sex, potential lifestyle such as physical activity, smoking, total energy intake and baseline BMI. HR and 95% CI for trans unsaturated fatty acid (TFA) 1.42 (1.09-1.84) with a significant dose response relationship. There was no substantial change in the result after adjusting for potential life style and adherence to mediterrian diet. On the contrary an inverse relationship was obtained for MUFA and PUFA.</td>
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<td>Wolfe et al.</td>
<td>National Health and Nutrition Examination Survey Epidemiology Follow-up (NHHEFS). 4856 subjects: 1947 Male, 2909 female. 32–86 years. Dietary intake of fatty acids: 24-h dietary recall at baseline. Assessed only at follow-up using the CES-D scale. The following covariates</td>
<td>Saturated FA: No association with Severe Depressive Mood (SDM). Linoleic FA: Positively associated with the risk of SDM in Men. OR of SDM by intake tertiles: first tertile: 1 (Reference); second tertile: 1.64 (95% CI = 1.06–2.54); third tertile: 2.34 (95% CI = 1.41–3.87) Oleic fatty acids: Negatively associated with the risk of SDM in women. OR of SDM by intake tertiles 95% CI: first tertile: 1 (Reference); second tertile: 0.88 (95% CI = 0.56–1.38); third tertile: 0.48 (95% CI = 0.25–0.95)</td>
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Subjects.

Study 3,9,10

4,5 11

Psychiatry.

Citation: examined in observational and experimental studies. Both studies

Conclusion by alteration of cortisone levels.

neurotropic levels. High fat diet reduces neurotropic levels possibly

depression like other mood disorders are directly proportional to brain

studies have shown that adding omega 3 fatty acid to antidepressant

is one of the main components of neuron membranes and is found

to its high content of long-chain ω-3 polyunsaturated fatty acids. This

protective effect could be attributed

depresive symptoms are unlikely in individuals with

lower concentration of ω-3 fatty acid and more likely in those with

higher concentration of ω-6 fatty acid. Although the result explains

the association between depression and fat content of diet, reverse

causality cannot be totally ruled out. Life stressors may not only

precipitate depression but also unhealthy eating lifestyles. A more

likely proposed theory is that unhealthy eating could be used to

ameliorate unpleasant mood. However in most of the studies when

adjusted for life stressor the result still remains the same. In future

more randomized trials are needed to determine role of ω-3 fatty acid

in treatment of depression.

Acknowledgements

None.

Conflict of interest

Authors declare that there is no conflict of interest.

References


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