Increased free malondialdehyde concentrations in smokers normalize with a mixed fruit and vegetable juice concentrate: a pilot study

Bamonti F, Novembrino C, Ippolito S, Soresi E, Ciani A, Lonati S, Scurati-Manzoni E, Cighetti G. Increased free malondialdehyde concentrations in smokers normalise with a mixed fruit and vegetable juice concentrate: a pilot study. Clin Chem Lab Med. 2006;44(4):391-5. doi: 10.1515/CCLM.2006.084. PMID: 16599830.

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BACKGROUND

Smoking

Smoking is a primary CVD risk factor leading to the formation of reactive oxygen species (ROS)

ROS

MDA is used as a biomarker to assess oxidative damage

ROS

Increased ROS production has a negative effect on homeostasis and can damage fundamental molecules

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AIM

The aim of this study was to evaluate the effect of a 30-day supplementation with an encapsulated fruit and vegetable juice powder concentrate on homocysteine metabolism and oxidative status, in light smokers and non-smokers.

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METHODS

One Arm, Open Label, Pilot Study

- 32 healthy male and female volunteers: 16 light smokers (10-12 cigarettes/day), 16 non-smokers
- Age of volunteers: 27-47 years
- Supplementation: encapsulated fruit and vegetable juice powder concentrate (Juice Plus+) 4 caps/day for 30 days
- Measurements after overnight fast at baseline and after a 30-day intervention

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METHODS

Parameters assessed pre- and post supplementation:

- VITAMIN B12
- TOTAL HOMOCYSTEINE
- FOLATE STATUS
- t-MDA
  - f-MDA
  - b-MDA

t-MDA: total malondialdehyde

f-MDA: free malondialdehyde

b-MDA: bound malondialdehyde

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f-MDA: chemically active and a potential damaging agent

b-MDA: excreted in urine, indicative of an old injury

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MAIN RESULTS

- **f-MDA concentrations:**
  - Baseline f-MDA: significantly higher in smokers than non-smokers
  - Decreased significantly after supplementation → reached non-smokers values

- **b-MDA concentrations:**
  - Baseline b-MDA: significantly lower in smokers than in non-smokers
  - Increased significantly after intervention

- Indicates that f-MDA was bound (b-MDA) and removed from the body through urine.

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CONCLUSION

“To the best of our knowledge, this is the first observational study carried out to evaluate the possible relationship between oxidative status, homocysteine status, tobacco smoking and juice powder concentrate supplementation. Above all, this is the first study to show a significant decrease in f-MDA levels in light smokers after just 1 month of daily phytonutrient supplementation”.

Article available at: https://pubmed.ncbi.nlm.nih.gov/16599830/