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BACKGROUND: Coffee oil potently raises serum cholesterol levels in humans. The diterpenes cafestol and kahweol are responsible for this elevation. Coffee oil also causes elevation of liver enzyme levels in serum. It has been suggested that cafestol is mainly responsible for the effect on serum cholesterol levels and that kahweol is mainly responsible for the effect on liver enzyme levels. The objective of this study was to investigate whether coffee oil that only contains a minute amount of kahweol indeed does not cause elevation of liver enzyme levels. **METHODS:** The response of serum alanine aminotransferase (ALAT) and aspartate aminotransferase (ASAT) to Robusta coffee oil (62 mg/day cafestol, 1.6 mg/day kahweol) was measured in 18 healthy volunteers. **RESULTS:** After nine days one subject was taken off Robusta oil treatment due to an ALAT level of 3.6 times the upper limit of normal (ULN). Another two subjects stopped treatment due to other reasons. After 16 days another two subjects were taken off Robusta oil treatment. One of those subjects had levels of 5.8 ULN for ALAT and 2.0 ULN for ASAT; the other subject had an ALAT level of 12.4 ULN and an ASAT level of 4.7 ULN. It was then decided to terminate the study. The median response of subjects to Robusta oil after 16 days was 0.27 ULN (n = 15, 25th,75th percentile: 0.09;0.53) for ALAT and 0.06 ULN (25th,75th percentile -0.06;0.22) for ASAT. **CONCLUSIONS:** We conclude that the effect on liver enzyme levels of coffee oil containing hardly any kahweol is similar to that of coffee oil containing high amounts of kahweol. Therefore it is unlikely that kahweol is the component of coffee oil that is responsible for the effect. Furthermore, we conclude that otherwise unexplained elevation of liver enzyme levels observed in patients might be caused by a switch from consumption of filtered coffee to unfiltered coffee.

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