Chocolate and acne: How valid was the original study?

Recent reviews on “The role of diet in acne: facts and controversies”¹ and “Nutrition and acne”² were interesting but may not have adequately challenged the dogma that chocolate does not exacerbate acne vulgaris. Our Medline search, using the key words “acne and chocolate,” showed that only 3 studies examined the role of chocolate consumption and acne. One clinical trial had 8 patients,³ another did not specify sample size,⁴ and the third study by Fulton, Plewig, and Kligman (1969) supported the oft-repeated assertion that eating chocolate has no effect on acne.⁵

While some reviewers acknowledge that few studies exist, they describe Fulton’s study among them as “a methodologically stronger trial.”¹ As a result, Fulton’s (1969) finding that chocolate consumption does not exacerbate acne has continued to remain virtually unchallenged for decades and continues to be cited even in this most recent review.

For the first time in over forty years, we thoroughly examined this 1969 classic paper entitled, “Effect of Chocolate on Acne Vulgaris,” published in the Journal of the American Medical Association. It was a crossover study with 65 participants consuming chocolate or placebo bars for four weeks (3-week wash-out period). A 30% decrease or increase in weekly lesion count resulted in “mild to moderate” acne being assessed as improved or worsened, respectively. The authors concluded that chocolate had no effect on acne severity; however, an analysis of this frequently cited paper reveals the following flaws:

Shortcomings

Subjects

The ages of 35 “young adult male prisoners” were not mentioned. Thirty adolescent boys and girls also participated, creating potential confounding effects of gender and age. Variables not considered were pubertal development, menstrual cycles, obesity, stress, lifestyle, caffeine use, smoking status, diet, and medical conditions that could affect acne.

Methods

“Mild to moderate” acne was not defined. Stratification of the diets, and their possible influence on acne progression, were unexplained. The trial duration was four weeks, although acne treatment may take 2 or more months to produce changes. While comparable to the chocolate bars in calories and fat percentage, the placebo bars had more partially hydrogenated vegetable fat that may or may not affect acne development. It is unclear how the chocolate and controls bars were determined to be “remarkably similar in taste,” as no taste tests were reported. The issue of compliance was not addressed. Acne exacerbation was poorly defined: subjects were considered worse if their “number” of “comedones, papules, and pustules” increased by 30%, but lesion type, size, and severity were not assessed, and only the left side of the face was observed for changes. Although subjects consumed bars daily, lesion counts were taken weekly to "simplify interpretation." Most importantly, only lesion counts at the end of one month were used to calculate significant differences. In practice, susceptible patients experience skin reactions within days of consuming offending foods.

Statistical analysis

A description of statistical methods is absent, with differences simply reported as significant.

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Conclusions

Our review shows a paucity of clinical studies on how chocolate may affect acne formation, and we find that the
Fulton paper, cited 77 times, is methodologically flawed. Even though doubt has been cast on the Fulton study, the influence of this paper has been far-reaching (perhaps due to the journal’s prestige) to the point that not even a recent review addresses its shortcomings. Clinicians cannot be unequivocal in their advice to acne sufferers on the inclusion or exclusion of dietary chocolate until a well-designed randomized controlled clinical trial is conducted. More importantly, this serves as a cautionary example of how “research-based evidence” should be vigorously scrutinized prior to being incorporated into clinical practice.

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