Acne vulgaris and nutrition
Kerstin Kassmannhuber, 0607620

Introduction:
Acne vulgaris is a common and inflammatory skin disease that is controlled by many factors like genetic issues, bacteria, improper skincare or increased sebum flow. Especially the diet plays a major role in its development. In particular, acne vulgaris mainly concerns the European population, which could affect the frequent milk consumption in these countries. Various studies are often associated with milk and acne, which is caused due to the high proportion of growth factors and the insulin-enhancing effect [Melnik, 2009]. Even the Western diet, which is rich in sugar, fat, processed food, etc. contributes to the development of acne as well [Costa et al., 2010]. However, there are also hints that the skin appearance can be improved by the consumption of certain food ingredients such as ω-3 fatty acids or a diet with low glycemic load [Bowe et al., 2010].

Materials and methods, experimental design, other methodological information:
The thesis is based on a literature research on scopus and pubmed. Many studies show a correlation between the genesis of acne and eating habits. The retrospective “Nurses Health Study”, a cohort study of 47 355 women, first showed a significant association between the prevalence of acne and the amount of daily milk consumption [Melnik, 2010]. The hormonal content of milk (especially Insulin Like Growth Factor-1, IGF-1) may be responsible for the development of acne [Adebamowo et al., 2005]. Since 2005, several studies showed a positive correlation between milk products and carbohydrates with high glycemic index as triggering factors of acne [Melnik, 2010]. The thesis includes many studies to explain several influential factors of nutritions and the pathogenesis of acne vulgaris.

Results and discussion:
Acne patients appear to have a high blood level of IGF-1, which may be caused by the increased consumption of milk and milk products. IGF-1 is a growth factor with insulin-like structure in milk and occupies the same receptor as the endogenously produced IGF-1 of human beings which is expressed by sebaceous glands [Danby, 2010]. Increased levels of IGF-1 and insulin lead to a lack of nuclear FoxO1 and further to an increased activity of the androgen receptor transcription. Androgenes stimulate the production of blackheads and stimulate skin lipogenesis [Melnik, 2010]. Carbohydrates with a high glycemic index stimulate the lipogenesis as well. A diet with a low glycemic load may change and improve skin lipogenesis and lower insulin and IGF-1 levels [Costa et al., 2010], [Danby, 2010]. On the other site, the supply of ω-3 fatty acids may improve the inflammatory process of acne vulgaris by the suppression of inflammatory mediators such as leukotriene B4. The “gut-brain-skin-axis” describes a correlation between depression, anxiety and skin conditions such as acne. Emotional conditions may change the intestinal microflora which may increase intestinal permeability and promote inflammation.

Conclusion:
The western diet is characterized by a high fat and sugar share and the consumption of ω-3 fatty acids is low. Milk, which is often used in processed food, stimulates the formation of acne. IGF-1 and a high insulin level lead to regulation fails of FoxO1 and androgens. A healthy lifestyle with a reduced consumption of milk and an increased intake of ω-3 fatty acids may avoid or support a drug treatment.
References:


Rubin, M.G., Kim, K., Logan, A.C. „Acne vulgaris, mental health and omega-3 fatty acids: A report of cases.” Lipids in Health and Disease 2008, 7, art. no. 36.

