Pediatrics & Therapeutics
ISSN: 2161-0665

Bucay, Pediat Therapeut 2012, 2:4
DOI: 10.4172/2161-0665.1000e111

Editorial Open Access

Treatment of Cystic Fibrosis with Penicillamine. A Hypothesis Based on the Physiology of Mucus and Sweat

Alberto Halabe Bucay*

Hospital Angeles Lomas, Department of Pediatrics, Mexico

This work describes the possibility of treating cystic fibrosis with penicillamine, it would block the copper and other trace metals involved in the formation of mucus and sweat, and could decrease or improve their formation.

Cystic fibrosis, also called mucoviscidosis, is an inherited disease characterized by increased production of mucus in the lungs and digestive system and production of altered sweat.

It has been shown that in the mucus (sputum) of patients with cystic fibrosis, there are present trace metals, mostly iron and copper [1], and also zinc [1].

Interestingly, patients with cystic fibrosis have decreased their serum copper, which does not improve significantly after administration of this metal orally [2], this may be because the copper in these patients is been used for the formation of mucus [1]; sweat is also altered in patients with cystic fibrosis, maybe because the same mechanism: utilization of copper for its formation. There is enough evidence to demonstrate that trace elements, mainly copper and zinc, are present in sweat of normal people [3], so they must be present also in sweat of patients with cystic fibrosis in any stage of the disease. It is also important to remark that patients with Wilson's disease produce significantly smaller volumes of sweat [4], apparently, copper also participates in the physiology of sweat glands, the same glands affected in cystic fibrosis.

For all this evidence, the possibility of treating cystic fibrosis with penicillamine could succeed, as is in Wilson disease; penicillamine is one of the most effective chelators [5], and it would block the copper [5] and other trace metals involved in the formation of mucus and sweat, including zinc [6] and doing this, patients with cystic fibrosis would improve producing less mucus and sweat, or, better quality of both of them.

Penicillamine is effective as a treatment for rheumatoid arthritis [7] and has been used in patients with cystic fibrosis for the treatment of related arthritis [8], but so far, penicillamine has not been used to decrease mucus and sweat production by blocking the copper hypothetically involved in the production of them.

References

1. Gray RD, Duncan A, Noble D, Imrie M, O´Reilly DS, et al. (2010) Sputum trace metals are biomarkers of inflammatory and suppurative lung disease. Chest 137: 635-641.
2. Best K, McCoy K, Gemma S, Disilvestro RA (2004) Copper enzyme activities in cystic fibrosis before and after copper supplementation plus or minus zinc. Metabolism 53: 37-41.
3. Cohn JR, Emmett EA (1978) The excretion of trace metals in human sweat. Ann Clin Lab Sci 8: 270-275.
4. Schaefer M, Schellenberg M, Merle U, Weiss KH, Stremmel W (2008) Wilson protein expression, copper excretion and sweat production in sweat glands of Wilson disease patients and controls. BMC Gastroenterol 8: 29.
5. Youdim MB, Grünblatt E, Mandel S (2007) The copper chelator, D-penicillamine, does not attenuate MPTP induced dopamine depletion in mice. J Neural Transm 114: 205-209.
6. Chong CR, Auld DS (2007) Catalysis of zinc transfer by D-penicillamine to secondary chelators. J Med Chem 50: 5524-5527.
7. Muijsers AO, van de Stadt RJ, Henrichs AM, Ament HJ, van der Korst JK (1984) D-penicillamine in patients with rheumatoid arthritis. Serum levels, pharmacokinetic aspects, and correlation with clinical course and side effects. Arthritis Rheum 27: 1362-1369.
8. Thornton J, Rangaraj S (2009) Disease modifying anti-rheumatic drugs in people with cystic fibrosis related arthritis. Cochrane Database Syst Rev CD007336.

***Corresponding author:** Alberto Halabe Bucay, Hospital Angeles Lomas, Department of Pediatrics, Av Vialidad de la Barranca s/n, 52763 Mexico, Huixquilucan, Mexico, E-mail: doctorhalabe@hotmail.com

Received March 12, 2012; **Accepted** April 25, 2012; **Published** April 26, 2012

Citation: Bucay AH (2012) Treatment of Cystic Fibrosis with Penicillamine. A Hypothesis Based on the Physiology of Mucus and Sweat. Pediat Therapeut 2:e111. doi:10.4172/2161-0665.1000e111