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What is Orthomolecular Therapy?

“Orthomolecular therapy is the practice of varying the concentration of substances normally present in the body to prevent and treat disease, using the right nutritional molecules in the right amounts for the individual”

Linus Pauling

Double Nobel laureate Linus Pauling is generally regarded as the founder of orthomolecular therapy. He coined the term ‘orthomolecular’ in his famous article ‘Orthomolecular Psychiatry’ which was published in the leading scientific journal *Science* in 1968. Pauling’s research originally focussed on nutritional substances and their effects on mental health. However, his conclusions have also proven to be valid outside of psychiatry and have been successfully translated into many other branches of health science, all contributing to the field of orthomolecular therapy. This short paper will discuss what orthomolecular therapy is, but also how it is applied in everyday practice.

The word ‘orthomolecular’ is a contraction of ‘ortho’, which means ‘straight’ or ‘right’ in Ancient Greek, and ‘molecular’, which is derived from Latin and means ‘with regard to molecules’. Linus Pauling used the term to describe the idea that concentrations of substances present in the human body can be varied to prevent and treat disease, or that there exists a ‘right’ amount of certain beneficial substances that contribute to health. In addition, he was aware that such concentrations differed among individuals. Thus, ‘the right molecules in the right amounts’ will mean different things to different people, a fact that should be reflected in any orthomolecular intervention.

We All Share the Same Heritage

Human beings share an evolutionary heritage that roughly dictates which ‘molecules’ we should consume and which amounts are generally the ‘right amounts’. All of us are shaped by what our (ancient) ancestors consumed; our ancestors’ high intakes of fatty acids from fish may even have been responsible for the explosive growth of our brain, turning us from a regional hunter-gatherer into a global presence that is actively shaping the future of our planet. However, our lifestyles and diets have changed as well. This happened at such an

alarming rate, that our genes have not had the time to catch up and adapt to the new situation.

“Nutritional Science has [...] led to the recognition that diet plays a major role in the chronic diseases that cause the bulk of morbidity and mortality in modern societies, such as heart disease, diabetes [and] hypertension [...]”

Herbs and Natural Supplements – An evidence-based guide

When we were still living as hunter-gatherers in the land/water ecosystem, we consumed much more substances such as omega 3 fatty acids (EPA and DHA), arachidonic acid and salicylic acid than we do today. These important substances are not only beneficial for brain development, but also fulfil a crucial role in mediating our inflammatory response. What we did not, or only marginally, consume were grains, trans fatty acids, salt and sugars – substances that may cause Irritable Bowel Disease, cardiovascular diseases, high blood pressure and obesity. In short, consuming the 'wrong' molecules is an important component in the worldwide burden of chronic disease. Orthomolecular therapy offers natural interventions that help alleviate this burden, both on a personal and a global level.

Yet, We Are Unique

Despite our shared heritage, each individual human being has a unique biochemistry and psychological make-up. We all make our own personal life-choices with regard to environment, nutrition and social life, a fact that makes us unique. As a result, in health care, one size hardly ever fits all – treatments that work for some of us, may not work as effectively for others. To be able to establish the right balance of nutrients for optimum health, orthomolecular therapy considers both evolutionary and personal nutritional needs, the latter of which are determined during a thorough anamnesis.

Orthomolecular practitioners generally focus on chronic disease, since acute health problems are generally successfully dealt with by a General Practitioner or a hospital-based medical specialist. Since regular medicine in general has no definite solutions for chronic health problems and degenerative diseases, orthomolecular medicine can be a valuable adjuvant therapy for patients. Orthomolecular therapists should however never discourage or withhold their patients regular medical care.

Two Famous Examples

As a human species, somewhere along the line of evolution we have lost the ability to synthesize our own vitamin C. Most other mammalian species still have this ability. A lack of vitamin C inevitably leads to scurvy in humans, and chronic sub-optimal levels of this vitamin

may in the long run even result in atherosclerosis. We can therefore conclude that we are naturally deficient in vitamin C and should obtain it through our diet. High dosages of vitamin C (more than 1 gram per day) have a significant immune-enhancing effect due to a positive effect on several immune parameters.

Another famous example is that of folic acid. In *Campbell Biology*, the authoritative university biology textbook, it is stated that:

"At a time when microsurgery and sophisticated diagnostic imaging dominate the headlines, a simple dietary change such as folic acid supplementation [...] may be among the greatest contributors to human health"

Campbell Biology

Folic acid is a well-known supplement for pregnant women in the prevention of degenerative conditions, including spina bifida, in babies. Research into supplementation of this important vitamin continues today more vigorously than ever – a short search on PubMed results in over 1200 publications treating of the health effects of folic acid, mainly with regard to mental development (not limited to the foetus). In recent years, some minor concerns have arisen that supplementation with folic acid alone might increase the severity of certain psychiatric disorders, including autism and schizophrenia. This problem does not appear to occur when folic acid is supplemented along with vitamins B6 and B12. One of the core ideas behind orthomolecular therapy is always to supply active ingredients along with synergistic substances, preferably those that naturally occur and work together, such as vitamin B6, B12 and folic acid.

Supplementation is Necessary

The fact that our body does not necessarily synthesize, or our diet does not always contain, the right amounts of nutrients indicates that supplementation may not only be necessary – it may even be a life-saver. More and more research shows that a whole range of substances may have beneficial health effects, including vitamins, minerals, flavonoids and fatty acids. Deficiencies in these substances may occur for several reasons, among which are today's nutrient-poor soils, relatively low intake compared to evolutionary reference values, physiological effects of environmental pollutants, low intake of vegetables and reduced ability of the human body to effectively absorb these nutrients. Orthomolecular treatments are most often directed at restoring these nutrient levels, or increasing them where necessary.

Not An Alternative Form of Therapy

Orthomolecular therapy and its closely related variants – nutritional therapy and functional medicine – take many ideas from biochemistry, medicine, evolutionary biology, health science and nutritional science. Orthomolecular science relies strongly on medical research and does not incorporate spirituality or any other philosophies of life. It is therefore radically different from homeopathic and several other alternative treatments. Additionally, treatments using nutrients are now becoming recognised in the mainstream biomedical community as a means of preventing and curing disease and as adjuvant therapy. As a direct consequence, orthomolecular science is gathering momentum as an evidence-based science and has a serious potential in today's healthcare.

Conclusion

To this day, Pauling's biomolecular view of human health and nutrition inspires a great deal of research, which is being published in prominent journals, including the *American Journal of Clinical Nutrition*, *BMC Evolutionary Biology*, the *British Journal of Nutrition* and *Medical Hypotheses*. The Natura Foundation plays an important role in disseminating this knowledge to practitioners and therapists around the world, so they too can reap the rewards of orthomolecular science in their practice.

For more information about orthomolecular therapy, the Natura Foundation or their courses, please visit www.naturafoundation.es.

Literature

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