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First steps towards demonstrating effectiveness of homeopathy in treating cancer

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In a recent paper by Toliopoulos *et al.*[1] published in the journal 'Cell Biochemistry and Function', the authors present a novel and promising approach to assessing the effectiveness of homeopathic products in fighting cancer. The authors, a Greek research group, investigated whether homeopathic complexes were able to stimulate the activity of Natural Killer Cells (NKCs) in fighting cancer cells.

Introduction

Natural Killer Cells are a subtype of lymphocytes (white blood cells involved in immune functions) which are able to recognise and kill a large variety of virally infected and cancerous cells[2]. Unlike other components of the immune system, NKCs do not require prior activation and are not targeted to specific antigen bearing cells[3]. Rather, NKCs recognise any cells which do not carry the correct markers which would usually identify a cell as a normal 'self' cell.

Most cancer patients undergoing chemotherapy are not immunodeficient, but they are unable to control the progression of the cancer cells. The idea tested by the research team was whether a homeopathic product would be able to enhance the natural killing ability of NKCs to help fight cancer. The same group previously looked into the ability of other alternative treatments (Vit-C, Aloe vera, flavonoids) to have this effect.

How do Natural Killer Cells find and kill cancerous cells?

NKCs are able to sense abnormal cells not by the presence of something foreign on the surface of the cell (an antigen) but by a lack of MHC-1 molecules (Major Histocompatibility Complex class 1). MHC-1 molecules allow your own normal cells to be identified by the immune system and are therefore referred to as markers of 'self'. As cancer cells are often impaired in their production of MHC-1, this allows NKCs to identify them as abnormal and attack them. NKCs kill target cells by secreting perforin, which ruptures the cell membranes, and proteases which degrade proteins inside the cells. Following attack by NKCs, cells either die due to apoptosis (programmed cell death a.k.a. clean death) or cell lysis where the cell 'explodes', liberating its contents directly into the surrounding fluid.

In vitro experiment

The study comprised two parts – one *in vivo*, the other *in vitro.* In the *in vitro* part, NKCs were first purified from the blood of healthy volunteers. These NKCs were then co-cultured with a batch of cancer cells (myeloid leukemia cells) to quantify their killing ability. Five different homeopathic complexes were then added to the mix to determine their effect on the killing ability of the NKCs. The five homeopathic complexes investigated were *Coenzyme Compositum, Ubichinon Compositum, Glyoxal Compositum, Traumeel* and *Katalysatoren*, all manufactured by Heel – a leading manufacturer of homeopathic combination medications.

The results of the *in vitro* experiments indicated that the combinations *Coenzyme Compositum* and *Ubichinon Compositum* were effective ($p<0.05$) in increasing the natural killing ability of NKCs. Although promising, these results need further duplication.

In vivo study

15 patients in advanced stages of various cancers (colon, lung, breast, lymphoma and fibrosarcoma) participated in the *in vivo* part of the study. The patients received all five preparations in conjunction for 3 months, with the following regimen: injections of three ampules per week of *Coenzyme Compositum, Ubichinon Compositum* and *Glyoxal Compositum*, 20 drops of *Traumeel* three times a day and ten ampules per week of *Katalysatoren*. Blood samples were collected before and after the administration of the homeopathic preparations. The NKCs were extracted from the samples and their toxicity analysed by co-culturing them with cancer cells.

The results indicated a statistically significant increase in killing ability of the NKCs both in patients receiving chemotherapy at the time of the experiment and in those not receiving chemotherapy. However, the effect was more marked in the group receiving chemotherapy, in which the killing ability of the NKCs post-homeopathic treatment was increased by up to 105%, as compared with pre-treatment.

Studies have shown that NKCs have impaired activity in a number of clinical conditions including cancer[4]. A number of chemotherapeutic agents have also been shown to further inhibit NKC numbers and killing abilities[5-7]. This study confirmed these findings, as patients receiving chemotherapy not only showed lower numbers of NKCs but these had a lower cytotoxic ability than those in patients who had completed their chemotherapy.

Limitations of this study

There is the potential for a placebo effect to contribute to the results seen with any type of medical intervention. When testing a new intervention, a common way to separate this effect from a true clinical effect is by carrying out a placebo controlled study. This study was not placebo controlled and personal communication with the authors has established that the addition of a placebo group was ruled out for ethical reasons. Although this is understandable with such advanced cancer patients, the potential role played by the placebo effect should be considered when interpreting the results.

In this instance the impact of a placebo effect is likely to be low because such end-stage patients would have been receiving medication (both injections and orally) on a regular basis for years prior to the study. With the lack of a placebo arm, one also has to consider the possibility that the increase in NKCs killing ability during the time of the experiment was not related to the intervention given. This is unlikely, given that other studies indicate that the number and cytotoxicity of NKCs decreases as cancer progresses and no reversal of this general trend could be expected in these patients.

Critics of homeopathy frequently state that any clinical improvements seen from homeopathic treatment are due to a combination of the placebo effect and the therapeutic effects of 'time and attention' during the homeopathic consultation. The latter is not a factor in this study because the treatment given was not individualised and therefore no homeopathic consultations were needed.

Obviously, the low number of patients taking part in the study underlines the preliminary nature of this study and the need for further confirmation of the results using a larger cohort of patients.

Conclusion

Considering the importance of NKCs in fighting cancer, any therapy which would be able to increase the efficiency of NKCs would be a welcome addition to the existing anti-cancer arsenal. When one also considers the lack of side-effects of these homeopathic preparations, their relatively low-cost and the poor prognosis faced by patients with advanced cancers, it would seem unethical not to investigate such a possibility further.

As the greatest improvement from homeopathic treatment was seen in patients receiving chemotherapy, it would seem vital that more research be carried out to confirm this set of results, with the aim of developing an adjuvant homeopathic treatment to be introduced into routine cancer care alongside chemotherapy. In particular, it would be interesting to investigate *in vivo* which homeopathic preparations provided the most benefit in terms of NKC numbers and cytotoxicity. Furthermore, a comparison of these results with those achieved by prescription of individualised homeopathic medicines by a homeopathic practitioner (the most commonly practised form of homeopathy) would be of great interest. The latter may have the potential to provide broader patient benefits, by not only enhancing NKC action, but also improving the overall quality of life of cancer patients.

References

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