



New Era of Complementary and Alternative Medicine (CAM) in Cancer Care

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In recent decades, treatment of cancer has great epoch-making progress, such as target therapy with genetic or molecular prediction; immunotherapy also provides a groundbreaking platform in both research and treatment respects. Cancer patients now live much longer than before. However, many patients still seek for complementary and alternative therapy to overcome the side effect of treatment or just for improve quality of life. That is why some researchers and physicians start to face this issue, and research in integrating modern medicine and CAM get more attention. Accordingly, we notice that a new era of CAM will be expected based on following points.

Applying the Concept of Precision Medicine in Herbal Medicine

The basic study help connect the CAM and Modern Medicine in a scientific platform. As the cancer treatment has evolved to a precision medicine era. How to apply precision medicine in CAM will be an issue. Precision medicine focuses on certain genetic prediction and tends to draw a picture of what the biomarker or gene mutation will connect to a certain drug's effect. Just like Arsenic trioxide (As₂O₃), a toxic Chinese medicines, has been successfully applied in the treatment of acute promyelocytic leukemia, many other herbs or historical formulas have been believed with efficacy in regulating tumor microenvironment or even immune-checkpoint modification, which might be compatible with the theory of reconciling the Yin-Yang concept of Traditional Chinese Medicine. To make herbal medicine more evidence based, more and more researchers devoted themselves in applying this concept in herbal medicine. Though there are varied components in herbs, it is hard to pinpoint the herb's effects just through single component as some herbs have synergic effect; the precision medicine plays a critical role in future fields of pharmaceutical and cancer care. For instance, recent studies focus on herbs effect on epithelial-mesenchymal transition (EMT); PD-L1 regulation; adjusting tumor microenvironment; or effect of decreasing drug resistance are rapidly progress, implying the potential of connecting precision and herbal medicine. Actually, by connecting precision and herbal medicine, we could find more unknown or obscure properties of traditional medicine. Moreover, herbal medicine work on not only one pathway, but multi-levels effects, scientists also find relationships between certain categories of plants with effect on certain pathways, which will help map the characteristic of nature products, thereby benefit the anti-cancer drug research and development.

More Holistic Care Study Will Be Noticed

People chose complementary and alternative medicine because they deem CAM is much milder, non-aggressive and based on holistic care concept. Nowadays, cancer patients pay attention to not only the survival but also the quality of life. Acupuncture, Yoga, Meditation and music and art therapy are all methods to promote quality of life. What holistic care stresses are not only the quantified measurements, such as the shrinkage of tumor burden or overall survival, but the function of living, symptom improvement or even the good-death and issues of spirituality. These fields, namely; are some-how more artistic, than scientific oriented, which make research

more difficult. Instead emphasizing only scientific method in this field, scholars nowadays are more willing to acknowledge the multidisciplinary studies which could draw pictures from not only an angle. In fact, that is the real life, from physical to spiritual, from patients to care giver and even the families, society, of whom will be the users need CAM. Accordingly, holistic care will be as emergent as the precision medicine since both are personalized medicine yet just like two sides of a coin, see things from different perspectives. How to integrate and conduct multi-disciplinary research, clinical care or even project, policy will be an issue and art in the new era of CAM.

Integrating Artificial Intelligence (AI) With Complementary and Alternative Medicine (CAM)

Artificial intelligence, a technology which cannot be ignored, could be used to promote health care and research, and of course in cancer care with CAM. A critical point is that as Chinese medicine is based on big data from ancient books and records which then analyze syndrome clusters and prescribe the corresponding herbs; artificial intelligence may apply in digitalizing and deciphering these data and conducts analysis so that makes the logic and rules much clearer. Actually, some research now use AI to find potential herbs which have immune modulating activity and apply in conducting Chinese Medicine related clinical trials. In other words, informatization of the TCM is crucial and beneficial in promoting evidence-based research as well as in Chinese medicine education.

On the other side, artificial intelligence could be applied in wearable device design to monitor physiologic signs such as HRV parameter, pulse records, tongue fur changing, and researchers can incorporate the intervention such as meditation or yoga, etc. and analyze the changes of series data. Since cancer patients are a specific population, needs long term observation, AI auxiliary treatment has the role in collecting complete information and making the clinical decision.

To sum up, though CAM is viewed as different from mainstream medicine, it always has a role for people need it. We believe that through combining varied, biological, artistic, and scientific perspective viewpoints, the future of CAM is inevitable needs to connect with precision medicine, holistic care, and artificial intelligence. The method and technology could be innovative, yet the spirit is the same, to help people get health, in one or another way, improving the quality of life, not only the physiologic levels but a holistic level, reconciling the conflicts between mainstream medicine and CAM, and therefore lead to harmony.

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