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MedBulletin

Intercessory Prayer: Issues in Investigating Medicinal Faith

MedBulletin by Fanyu Yang

Research on intercessory prayer is a recent attempt to scientifically investigate the health benefits of religious activity. In these studies, patients are randomly assigned to receive either standard care or standard care plus the prayers of distant intercessors. To date, the empirical results of trials remain conflicting. They have however, raised growing questions on the ethical and methodological basis of intercessory prayer as an "experimental drug".

Many studies waive key precepts in the ethical conduct involving human subjects by specifically averting informed consent to avoid patient expectations that might provoke a psychosomatic 'placebo' response. This arguably overlooks the patient's spiritual autonomy and well-being. In addition, problems arise in identifying subject and control groups. Even if patients are matched based upon type and stage of disease, it is highly difficult to find equivalent groups based upon faith or "receptiveness" to healing by prayer. The laws of statistical reasoning caution that with enough outcomes measured, a statistically significant difference will arise by chance even when no real difference exists. This in turn raises the question of how "much" prayer is statistically significant. Can prayer be measured by time, the degree of sincerity or fervency? Does the faith tradition (e.g., Buddhism, Christianity, etc.) of the intercessor matter?

The power of personal faith and its contribution to health and healing may be indisputable. However, debate over clinical trials of intercessory prayer raises questions on how to align such faith with the scientific method, or whether it is possible at all. Medical academians should therefore engage in critical bioethical evaluation and weigh arguments for and against such trials.

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Depressed Doctors and Prescription Blunders?

MedBulletin by Veronica Chan

A recent cohort study conducted at two paediatric hospitals in the United States suggests that prescription errors by junior doctors are, to a great extent, associated with mental health state indicators like depression and burn-out. Many investigations have been conducted on medication errors and patient mortality with respect to the systems' flaws and have proposed some appalling statistics. Preventable prescription blunders account for nearly 7000 deaths in the United States yearly, and less experienced physicians are found to be responsible for the majority of these incidents. However, the mental health of young doctors as a key factor in influencing judgment and decision-making in medical practice is rarely examined.

Fahrenkopf and his research team selected children's hospitals as sites of study since paediatric care often involves the prescription of atypical drug varieties and the re-calculation of lower dosages. This poses a heightened risk for error. In surveying 123 junior doctors, nearly 20% experience symptoms of depression and 74% suffer from burn-out. When correlated with a six-week record of medication blunders of the same physicians, it was found that those who match the criteria for depression are six times more likely to err in clinical practice. Much to the researchers' surprise, burn-out and prescription errors were not found to have a statistically significant relationship, despite previous evidence of a correlation between burn-out and poor clinical performance.

It is recognized that the findings of this short-term, considerably subjective study are far from being conclusive or constructive in the development of strategies to prevent medication errors. Nevertheless, it provides an insightful starting point for future investigation, highlighting the need to examine the effects of multifaceted personal factors like the mental health of physicians on clinical performance. Findings from prospective large-scale, standardized studies will be required before firm conclusions can be drawn in this critical issue of patient safety.

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MedBulletin

Orchestrating Insulin Resistance

MedBulletin by Randall Lau

Researchers at the Salk institute for Biological Sciences have uncovered the specific molecular mechanism at the root of insulin resistance. The final enzyme in the hexosamine pathway, O-linked ß-N-acetylglucosamine transferase (OGT), has been identified as crucial for turning off the cell's insulin response. In normal physiology, when insulin binds to its receptor on the cell surface, it immediately stimulates the production of PIP3, a specialized lipid molecule which orchestrates the synthesis and storage of complex carbohydrates, proteins, and lipids. Within minutes of the insulin pathway's initiation, OGT is recruited from the nucleus to the plasma membrane where it combines with the same lipid responsible for initiation, PIP3, to gradually turn off the signaling system.

OGT forms the necessary PIP3 binding domain by tagging key factors in the insulin signaling network with sugar molecules, namely O-linked ß-N-acetylglucosamine (O-GlcNAc). The sugars are produced by the hexosamine pathway, and their concentration is directly proportional to the availability of glucose and other high energy molecules in the bloodstream. The hexosamine pathway is now understood to act as a fuel gauge that drives the regulation of OGT activity and in turn, the duration of the cell's insulin response.

In environments where nutrients are in excess however, O-GlcNAc levels balloon quickly. Subsequently, OGT activity is over-stimulated causing the cell's insulin response to be cut short. This mechanism has been observed in murine models to result in abnormal blood sugar levels and insulin resistance soon thereafter. If OGT activity is not strictly regulated, the prolonged insulin inhibition is a strong indicator of Type II diabetes to follow.

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Too Much of a Good Thing?

MedBulletin by Simone Liang

Many people take vitamin supplements to compensate for a lack of essential nutrients and minerals. However, researchers are beginning to question the benefits of supplements as studies begin to suggest that supplements could affect one's risk of getting cancer. Vitamin E is an anti-oxidant, which can prevent cellular damage from unstable radicals, but scientists now wonder if high dosages of anti-oxidants may actually damage cells.

A study conducted by US researchers has found that high intake of vitamin E slightly increases the risks of lung cancer, especially among smokers. Consisting of 77 000 people, researchers monitored the intake of folic acid, vitamin C and vitamin E for four years. By the end of the study, 521 people had developed lung cancer, and vitamin E was the only supplement that had affected the risk of lung cancer. The relationship between vitamin E and lung cancer was more commonly found among, but not restricted to, smokers. Researchers conclude that the daily dose of 100 milligrams of vitamin E supplement increased the risk of lung cancer by seven percent.

In another study that consisted of male smokers, an 18 percent increased risk of lung cancer was correlated with the supplement beta-carotene. Inconclusive evidence shows that high dosages of supplements can increase one's risk of getting cancer, while others show no effect, and some show benefits. However, repeated studies show that a healthy diet provides all the necessary vitamins, and does not affect one's risk of cancer.

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