What Does Zinc Do?

Zuhair Al-Musawi
Karbala Medical College

Adequate zinc intake is critical for health; Zinc deficiency affects cells of immune system. It causes a reduction in the number B lymphocytes and T lymphocytes (CD4 lymphocytes in particular) through increased apoptosis and also reduced their functional capacity. The functions of the macrophage, another key immunological cell that engulfs and destroys bacteria, are also compromised. The production and potency of several cytokines, the central messengers of the immune system, are also perturbed by zinc deficiency. Many of these changes occur even in the early stages of deficiency.
Zinc plays a part in the maintenance of epithelial and tissue integrity through promoting cell growth and suppressing apoptosis and through its underappreciated role as an antioxidant, protecting against freeradical damage during inflammatory responses. Thus, in the case of diarrhea, multiple functions of zinc may help to maintain the integrity of the gut mucosa to reduce or prevent fluid loss. Notably, these responses can occur within 48 hours, much more rapidly than the direct effects of zinc on cellular development.
The recommended daily allowance is only 10 mg elemental zinc, but many people in both developing and industrialized countries do not have this in their diet. Zinc deficiency is biochemically defined as a serum concentration of less than 9 µ mol/l. however, serum zinc concentrations may not fully reflect the physiological zinc status in an individual, and individuals with apparently normal serum concentrations may benefit from daily zinc supplements.

Benefits of supplementations
This is clearly illustrated in several randomized controlled trials of zinc supplementation.

A meta-analysis indicated that daily zinc supplementation can reduce the incidence of pneumonia by 41% and diarrhea by 18%.
A meta-analysis of trails of adjunctive zinc supplementation in children with diarrhea Reduce the duration of illness by 24%. A trail of daily zinc supplementation in otherwise healthy children from New Guinea reduced the number of cases of malaria seen at a health clinic by 38%.

There is also evidence that zinc supplementation could offer benefit to pregnant women and their babies. One study showed that prenatal zinc supplementation can increase birth weight, and another indicated reduced incidence of diarrhea and other morbidities in the infants. Babies who are small for gestational age also seem to benefit from taking daily zinc supplementation. A trail in India found that babies who received zinc from 1 month onwards were 60% less likely to die during infancy. Lastly, several studies indicate a potential role for zinc and supplements that contain zinc in improving immune status and health in elderly people. Zinc supplementation, therefore, seems be particularly critical during periods of immune development or degeneration early childhood, pregnancy, and later life.

Drug-eluting Stents & Its Drawback

Karim Al-Naffii
Karbala Medical College

The story of sirolimus began in 1975 on Easter Island, in the South Pacific, a remote, enigmatic place known for the prominent stone statues that punctuate its landscape. An actinomycete, *Streptomyces hygroscopicus,* cultured from a sample of the island's soil, was found to produce through natural

fermentation a novel macrolide antibiotic with potent antifungal, immunosuppressive, and antimitotic activities. The generic name of the resulting drug is sirolimus, it is also known as rapamycin, after Rapa Nui, the name given to Easter Island by its inhabitants.[1]

Drug-eluting stents significantly reduce the risks of both restenosis and target-vessel revascularization after elective PCI, as compared with uncoated stents*]* [2]

In September, at the World Cardiology Congress in Barcelona, Donald Baim, a cardiologist who is the new chief medical and scientific officer of Boston Scientific, was talking to a reporter when he mentioned disturbing new findings regarding the risk of late thrombosis associated with drug-eluting coronary stents. The revelation fueled a newly ignited controversy. Lauded as a means of preventing restenosis, drug-eluting stents have been implanted in nearly 6 million patients worldwide since they were introduced 3 years ago

In the light of recent studies suggesting that drug-eluting stents may pose a risk of thrombosis that was not observed during pre-market testing, the Food and Drug Administration (FDA) convened a meeting of its Circulatory System Devices Advisory Panel on December 7 and 8, 2006, to examine the safety of these devices. The FDA will carefully consider the information and views presented at the meeting in deciding on future actions

An understanding of the mechanisms of neointimal growth within bare-metal stents led to the development of drug-eluting stents designed to reduce restenosis rates. Both drug-eluting stents approved by the FDA

(Cordis's Cypher stent, approved in 2003, and Boston Scientific's Taxus stent, approved in 2004) were shown to be effective in reducing repeated-revascularization rates, as compared with bare-metal stents

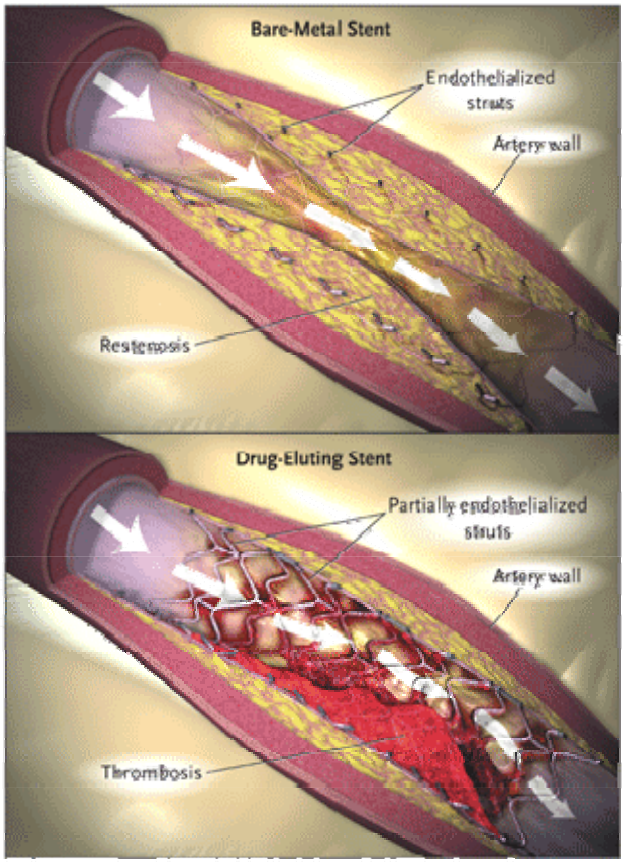
Soon after approval, there were reports of subacute stent thrombosis in patients who received Cypher stents. Stent thrombosis is a serious adverse event commonly associated with sudden death or acute myocardial infarction

In September 2006, a meta-analysis of randomized trials suggested that there is a small but significant increase in the risk of death or Q-wave myocardial infarction throughout a period of 3 years after implantation of a Cypher stent, possibly because of late stent thrombosis

The panel agreed, and the FDA concurs, that when drug-eluting stents are used for their approved indications, the risk of thrombosis does not outweigh their advantages over bare-metal stents in reducing the rate of repeated revascularization. But the panel also concluded that, as compared with on-label use, off-label use is associated with increased risks of both early and late stent thrombosis, as well as death and myocardial infarction.

Given the benefits and risks, physicians should consider certain patient characteristics in deciding whether to use a drug-eluting or a bare-metal stent. For example, patients who cannot comply with extended clopidogrel use or have planned procedures requiring early discontinuation of antiplatelet therapy may not be candidates for a drug-eluting stent. Patients should be thoroughly educated about the need for strict adherence to the recommended course of antiplatelet therapy and should discuss any changes with their cardiologist. Health care providers who are considering discontinuation of antiplatelet therapy in order to perform invasive procedures should also consult with the patient's cardiologist. Millions of patients with coronary artery disease worldwide have received coronary-artery stents, and the enormous health benefits of this technology are not in dispute.

Still, when a potentially serious albeit uncommon complication such as stent thrombosis is detected, it is mandatory that everything possible be done to aggressively examine the complication, assess the risk, understand the pathophysiological been


Bare-Metal Stent
Endothelialized struts
Artery wall
Restenosis
Drug-Eluting Stent
Partially endothelialized struts
Artery wall
Thrombosis