treatment for various malignancies. However, most of the cancer chemotherapeutic agents are associated with significant side-effects which often nullify the gains achieved in terms of improved cancer outcomes. Cardiotoxicity is one of the most important complications of cancer chemotherapy and may be associated with significant morbidity and mortality. Anthracyclines and monoclonal antibody-based tyrosine kinase inhibitors are the two agents most notorious for causing cardiotoxicity.

Several different approaches are being evaluated for preventing development of cancer chemotherapy-related cardiotoxicity. Thorough pre-treatment cardiac evaluation to identify patients with pre-existing cardiac diseases or those at risk of developing cardiotoxicity and limiting the maximum dose of the potentially cardiotoxic agents are very helpful in reducing the likelihood of cardiotoxicity associated with cancer treatment. Nonetheless, cardiotoxicity can develop even in patients without pre-existing cardiac illness and is not always dose-dependent, thus limiting our ability to prevent cardiotoxicity with reasonable certainty. Consequently, several alternative approaches are being evaluated to prevent cancer chemotherapy-related cardiotoxicity. Animal experiments and initial human studies, most of which were non-randomized, have shown that many of the cardiac drugs such as angiotensin converting enzyme inhibitors (ACEI), beta blockers and statins may be helpful in preventive cardiotoxicity with cancer drugs. To this effect, the present study by Bosch et al represents a well-performed randomized trial, which showed that a combination of enalapril (an ACEI) and carvedilol (a beta blocker) was effective in preventing development of LV systolic dysfunction in patients receiving intensive chemotherapy for hematological malignancies. The therapy was also effective in improving clinical outcomes in this patient population. The reason why patients undergoing HSCT did not derive much benefit was related to the fact that they did not receive prolonged chemotherapeutic treatment and were therefore at low risk of having cardiotoxicity. A strong point of the study was that the changes in LVEF were assessed by both echocardiography and cardiac MRI, which improved the reliability of the study findings. However, the major limitation of the study was its small sample size. In addition, the magnitude of the benefit observed in this study was small, in part because of the fact that only the patients with normal LVEF and no cardiac illness at baseline were included. Thus, while this study has shown encouraging findings, larger studies are required to confirm these findings and to also assess role of these agents in preventing cardiotoxicity in different types of malignancies and with different chemotherapeutic agents.

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Background: Infectious agents, especially bacteria and their components originating from the oral cavity or respiratory tract, have been suggested to contribute to inflammation in the coronary plaque, leading to rupture and the subsequent development of coronary thrombus. We aimed to measure bacterial DNA in thrombus aspirates of patients with ST-segment-elevation myocardial infarction and to check for a possible association between bacteria findings and oral pathology in the same cohort.

Methods and results: Thrombus aspirates and arterial blood from patients with ST-segment-elevation myocardial infarction undergoing primary percutaneous coronary intervention ($n = 101$; 76% male; mean age, 63.3 years) were analyzed with real-time quantitative polymerase chain reaction with specific primers and probes to detect bacterial DNA from several oral species and *Chlamydia pneumoniae*. The median value for the total amount of bacterial DNA in thrombi was 16 times higher than that found in their blood samples. Bacterial DNA typical for endodontic infection, mainly oral viridans streptococci, was measured in 78.2% of thrombi, and periodontal pathogens were measured in 34.7%. Bacteria-like structures were detected by transmission electron microscopy in all 9 thrombus samples analyzed; whole bacteria were detected in 3 of 9 cases. Monocyte/macrophage markers for bacteria recognition (CD14) and inflammation (CD68) were detected in thrombi (8 of 8) by immunohistochemistry. Among the subgroup of 30 patients with myocardial infarction examined by panoramic tomography, a significant association between the presence of periapical abscesses and oral viridans streptococci DNA-positive thrombi was found (odds ratio, 13.2; 95% confidence interval, 2.11–82.5; $p = 0.004$).

Conclusions: Dental infection and oral bacteria, especially viridans streptococci, may be associated with the development of acute coronary thrombosis.

1. Perspective

Poor dental hygiene has been linked to an increased risk of cardiovascular diseases. A recent meta-analysis[1] and a recent large population study[2] have shown a correlation between coronary artery disease and dental health like alveolar bone loss, pathological periodontal pockets and missing teeth. However, there was no consensus on the most pathologically relevant bacteria.

This study demonstrated that oral bacterial DNA, especially oral viridans streptococci, can be detected in the coronary thrombus aspirates of patients with ST-elevation MI undergoing primary PCI. Bacteria-like structures and components were detected by transmission electron microscopy and monocyte/macrophage markers for bacteria recognition

(CD14) and inflammation (CD 68) in thrombus aspirates by immunohistochemistry.

Oral streptococci have several characteristics that may either induce or maintain the atherosclerotic process: 1) they are able to attach to different surfaces and generate a biofilm enabling bacteria to infiltrate the tissue 2) they are capable of invading coronary endothelial cells and trigger the production of inflammatory cytokines and monocyte chemoattractant proteins 3) they also have thrombogenic properties and also initiate platelet aggregation in atherosclerotic plaques. A surface protein of one of these species of bacteria has been found to bind to the fibrinogen receptor of platelets. These findings suggest that oral viridans streptococci may be more than innocent bystanders with an affinity for inflammatory environments. The detection of DNA specific to oral pathogens together with costimulation of monocyte–macrophage receptors CD14 and CD 68 in thrombus aspirates suggests that these pathogens disseminate into systemic circulation, migrate to coronary plaques and cause or maintain inflammation.

The oral cavity contains ~1000 species, of the streptococci, *Streptococcus sanguis* and *Streptococcus gordonii*, detected in this study using streptococcal virulence factors *gtf* P&G, can be found only in the oral cavity.

The most common procedures associated with transient bacteremia were root canal treatments and treatment for periapical abscess. It has been hypothesized that repeated transient bacteremias after such dental procedures may cause an accumulation of pathogens in atherosclerotic plaques, which may act to boost the inflammatory process and to maintain low-grade inflammation.

This study also showed a very significant finding that there was an inverse association between the number of stenotic vessels and dental abscess and bacteria suggesting that dental infection and bacteremia are not linked with coronary stenosis but with the rupture of vulnerable plaques only.

In my opinion, the findings of the present study points to the fact that poor dental hygiene is linked to increase in atherosclerotic events like AMI most probably via increased inflammation and rupture of the vulnerable plaque. The detection of not only inflammatory markers but also bacteria and their DNA components point to a direct role rather than only a co-incidence. This calls for improvement in oral and dental hygiene, in addition to control of conventional risk factors for CAD, especially in our country where there is increased incidence of bad habits like chewing of tobacco, betel nuts and very poor oral hygiene. Moreover, prophylactic antibiotics before any dental procedure should be advocated not only to reduce infective endocarditis but also the risk of future coronary events.

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Background: Occupational health hazards associated with fluoroscopic-based procedures are well known, including a high prevalence of orthopedic problems and those related to radiation exposure, particularly cancer and cataracts. This article reports the "first-in-man" clinical experience with a novel radiation protection system designed to eliminate radiation exposure to operators and thereby obviate the need for orthopedically burdensome leaded aprons. The Trinity Radiation Protection System consists of a combination of fixed shields, radiation drapes, and interconnecting flexible radiation resistant materials creating a complete radiation protection environment for the operators, yet maintaining full and unimpeded contact with the patient and total control of all operational elements of the catheterization equipment.

Methods and results: This report constitutes an analysis of 19 nonrandomized cases in which operator radiation exposure data were collected (Trinity Radiation Protection System $n = 10$ cases versus standard shielding alone $n = 9$). In all cases performed with the Trinity System, there was neither any measurable significant radiation exposure in any anatomic region nor for the total case, whereas operators performing cases with standard shielding were exposed to radiation in all regions of their bodies (total per case exposure differences $p < 0.0001$).

Conclusion: The novel radiation protection system described is the first to provide a complete radiation barrier that eliminates radiation exposure to operators, thereby obviating the need for orthopedically burdensome leaded aprons. This approach to radiation protection has promise to enhance the safety and occupational health of medical personnel in the catheterization laboratory. © 2012 Wiley Periodicals, Inc.

1. Perspective

The modern era of fluoroscopically guided interventional procedures has resulted in dramatic increase in X-ray radiation exposure to both physicians and cath lab staff. Reports of radiation-induced cataracts, dermatitis, hematological malignancies and brain tumors have been reported in interventionists because of cumulative radiation dose. Recently