HEART OF THE MATTER

Deflating Door-to-Balloon Time

Both the American Heart Association and the American College of Cardiology have made a special effort to shorten door-to-balloon time in patients with ST-segment elevation MI in order to decrease the mortality of this high-risk group of patients.

Improvement in the logistics and quality of hospital systems has led to a significant decrease in door-to-balloon time (DBT). Systems have been initiated to effect rapid referral of ST-segment elevation MI (STEMI) patients to primary percutaneous coronary intervention (PCI) centers, either directly or by expeditious transfer of STEMI patients from facilities without interventional capability to PCI centers.

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This process has been vigorously advocated by the AHA through its program, "Mission: Lifeline" aimed at improving and shortening the arrival time of STEMI patients to PCI hospitals.

Several recent reports provide insight into the issues relative to the importance of shortening of DBT and give us reason to evaluate the nuances of our strategies. A recent report from Michigan examined the Blue Cross Blue Shield database between 2003 and 2008 that included 8,771 patients. The report indicated that the DBT decreased from an average of 113 minutes to 76 minutes over the 8-year period without any impact on mortality. The number of patients with DBT of less than 90 minutes was 28.5% in 2003 and 67.2% in 2008, with an observed hospital mortality of 4.1% and 3.8% respectively (Arch. Intern. Med. 2010;170:1842-9).

The authors suggested that the failure to affect mortality by shortening the DBT was due in part to the fact that the higher-risk patients accounted for most deaths and experienced the longest symptom-to-door time.

It has been clear for some time that although expeditious hospital therapy is important, the duration between symptom onset and eventual arrival in a medical facility represents the major delay to therapy, compared with DBT. As the patient wrestles with the significance of his or her indigestion or chest pressure, valuable minutes fly by that have critical effects on patient survival.

Major efforts have been made to acquaint patients with the importance of dealing with symptoms, to little avail. But the time from initiating contact with the emergency care system and the patient's arrival to the hospital is a time frame that we should be able to deal with, according to strategies proposed by Mission: Lifeline.

In a study of 6,209 Danish patients who were followed in a registry from 2002 to 2008 in a highly structured emergency care system – unlike that of the United States, which is a system in name only – the investigators observed that the elapsed time from the call for emergency care to the ultimate arrival in the hospital had the largest impact on patient survival, and had greater importance on survival than did DBT (JAMA 2010;304:763-71). A system delay of up to 60 minutes was associated with a long-term mortality of 15.4%, whereas a delay of up to 360 minutes doubled that risk to 30.8%.

The investigators indicated that programs focusing on the time between the first contacts with the health system to initiation of reperfusion will have the greatest impact on mortality.

The importance of the timeliness of early therapy (either PCI or fibrinolysis) was emphasized in a similar registry study carried out in Quebec in 80 hospitals during 2006-2007 (JAMA 2010;303:2148-55). PCI was the predominant mode of therapy for STEMI, either by direct transport to a PCI center or a transfer from a non-PCI center to a PCI center.

Delay in either therapy had a major effect on mortality, and was of particular importance in patients who were transferred from a non-PCI hospital to a PCI center. DBT in directly admitted patients to PCI centers was 83 minutes, compared with 123 minutes for transferred patients. The most striking observation was that regardless of the mode of therapy – fibrinolysis administered within 30 minutes or PCI within 90 minutes – the 30-day mortality benefit of early therapy was similar (3.3% with fibrinolysis and 3.4% with PCI).

Timing, therefore, trumps intervention.

These recent observations, developed exclusively from registry databases and not from randomized clinical trials, should give us pause to rethink our strategies. Registry data often can provide information that more closely represents actual community care.

The overemphasis on PCI for STEMI therapy has led to delay in treatment, when fibrinolysis could be just as effective. This pertains particularly to the patients who are transferred from non-PCI centers to PCI centers. More importantly, these studies emphasize the importance of developing better emergency care systems for the treatment of all patients, including those with STEMI. ■

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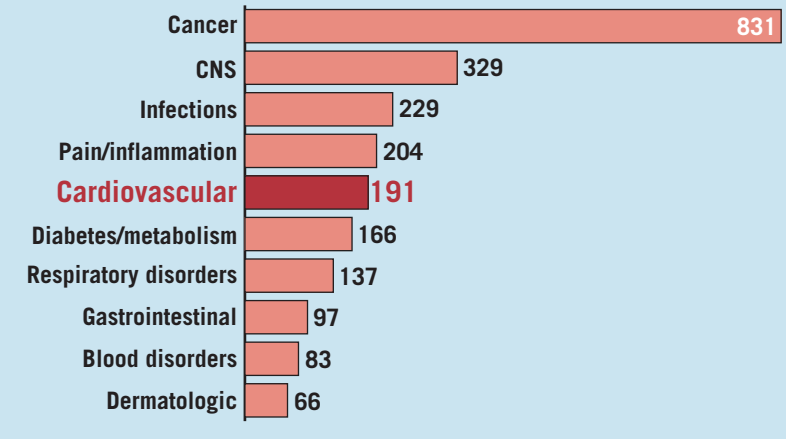
VITAL SIGNS

Almost 200 Cardiovascular Drugs in Development



Note: Includes drugs in phase I, phase II, and phase III or awaiting FDA approval for the top 10 areas of development in 2009.

Sources: Medco 2010 Drug Trend Report; R&D Directions 2009;15:4-89

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