

Hospitalization for more than 3 days after thrombolysis for uncomplicated myocardial infarction was not cost-effective

Newby LK, Eisenstein EL, Califf RM, et al. Cost effectiveness of early discharge after uncomplicated acute myocardial infarction. *N Engl J Med*. 2000 Mar 16;342:749-55.

QUESTION

For patients who have had a low-risk myocardial infarction (MI), is early discharge on day 3 instead of day 4 after thrombolysis safe and cost-effective?

DESIGN

Decision analytic model using data from a randomized controlled trial (Global Utilization of Streptokinase and Tissue Plasminogen Activator for Occluded Coronary Arteries [GUSTO-1]).

SETTING

{1081 hospitals in 15 countries}*.

PATIENTS

38 911 of 41 021 enrolled patients who presented with a confirmed MI 20 minutes to 6 hours after symptom onset and who had an uncomplicated course (absence of death, reinfarction, congestive heart failure, recurrent ischemia, stroke, shock, emergency angiography or angioplasty, bypass surgery, intra-aortic balloon pumping,

cardioversion, or defibrillation). Exclusion criteria were angiographic 3-vessel or left-main coronary artery disease or elective bypass surgery > 3 days after thrombolysis.

INTERVENTION

Discharge at day 3 compared with day 4 after thrombolysis.

MAIN COST AND OUTCOME MEASURES

Cardiac events on day 4 (reinfarction, stroke, recurrent ischemia, heart failure, and other major complications requiring readmission) and rate of preventable and non-preventable death. Costs were for hospital resources (including monitoring) and physician fees in 1997 U.S. dollars with a 3% annual discount rate. Sensitivity analyses were done.

MAIN RESULTS

During the 4th day of hospitalization, 16 patients (0.4%) had ventricular arrhythmias, 3 of whom died. These 16 patients

were older and more likely to have diabetes and a history of angina or MI. By keeping patients an extra day, 0.006 y (53 h) of life was saved at a cost of \$624/patient or \$105 629/life-year saved (95% CI \$65 777 to \$183 525). Sensitivity analyses showed that a 4th day of hospitalization was attractive only if the costs were reduced by 50% or a high-risk subgroup of patients could be identified.

CONCLUSION

Hospitalization of patients with uncomplicated myocardial infarction for > 3 days after thrombolysis was economically unattractive.

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COMMENTARY

As pressure to reduce medical costs increases, patients are discharged "quicker and sicker" after surgery and acute medical illnesses. Although longer hospital stays add to the margin of safety, are they worth the cost? Newby and colleagues used a decision model to examine the cost-effectiveness of staying in the hospital more than 3 days after an uncomplicated acute MI treated with thrombolysis. In their model, the only benefit of staying longer was preventing sudden death caused by ventricular arrhythmia—a rare event that occurs in approximately 8 of 10 000 patients. This benefit was weighed against the cost of staying 1 extra day in the hospital (\$624). Under these assumptions, the longer hospital stay was not cost-effective by accepted standards.

The results of this cost-effectiveness model are provocative and interesting, but they need to be confirmed in other studies before they can be accepted. Several additional factors must also be considered. First, a longer hospital stay might have additional benefits not considered in the model, such as improved patient education and better initiation of secondary prevention. Fumbling the handoff

between inpatient and outpatient care through hasty discharge could easily lead to preventable problems and reduce the net benefit. Second, the projected cost savings may be too optimistic because a modest increase in costly readmissions could wipe out the \$624 per patient saved by early discharge. For example, a 1% increase in the incidence of complications that cost \$30 000 each to treat would make the longer stays cost-effective.

Finally, Newby and colleagues did not actually discharge patients after 3 days—they only projected what might happen if this policy were adopted. Very few patients are currently sent home that quickly, and it will be critical to show the actual outcomes of this approach in prospective studies that are large enough to assure that low complication rates are maintained. Until such evidence is available, we should regard the study by Newby and colleagues as hypothesis-generating and in need of confirmation.

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