This problem is well illustrated in the study by Mangurian et al in this issue of JAMA Internal Medicine. The authors used California Medicaid data to identify patients who were prescribed an antipsychotic medication. They then assessed what percentage of the patients had some form of glucose screening, a recommendation by the American Diabetes Association2 for persons taking antipsychotic medications, in a yearlong period. Overall, 30.1% of individuals were screened. It would be fair to point out that the efficacy of screening for diabetes has not been well established. However, that less than one-third had such screening for a known adverse effect of antipsychotic medication use suggests opportunities for improvement in integrated health care. Among those who had at least 1 primary care visit during the year, the proportion screened was significantly higher at 35.6% vs 19.8% for those who had no primary care visit.

To improve care for persons with serious mental illness, it will be necessary to break down the silos that separate the mental health and physical health care systems. Integrated care (care provided by a team of physical and mental health clinicians—or at least colocated care (care provided by physical and mental health clinicians in the same place)—offers the promise of improving the physical health of individuals with mental illness, as well as the mental health of those seeking physical health services.

Mitchell H. Katz, MD

Conflict of Interest Disclosures: None reported.


LESS IS MORE

Use of Intra-aortic Balloon Pump in a Japanese Multicenter Percutaneous Coronary Intervention Registry

We read with interest the recent meta-analysis by Ahmad et al1 demonstrating a negative association between intra-aortic balloon pump (IABP) therapy and mortality among patients experiencing acute myocardial infarction. We agree that efforts are needed to clarify the role of IABP therapy and to examine its effect on care in other regions and countries. In Japan, IABP therapy is frequently used in patients with guideline-based indications and in patients with less established indications, and the judicious use of invasive procedures has been highlighted.2,3 Our objective herein was to investigate the prognostic effect of IABP use in patients undergoing percutaneous coronary intervention (PCI) for nonacute and acute indications registered in a contemporary multicenter Japanese PCI registry (Japan Cardiovascular Database-Keio Interhospital Cardiovascular Studies4).

Methods | We analyzed data from 14,378 consecutive patients treated between September 2, 2008, and May 19, 2014. Of those, 1,124 patients were excluded because of missing baseline information (n = 192), registration for staged PCI during the same hospitalization (n = 801), or PCI performed under percutaneous cardiopulmonary support (n = 132). The remaining 13,253 patients were included herein, and logistic regression models for in-hospital mortality were used to correct for differences in variables. We included in the logistic regression model all variables exhibiting a significant (P < .10) bivariate association with IABP use. Baseline inequality between patients with and without IABPs was evaluated with the baseline inequality index, the same method used by Ahmad et al.1 Because our study focused on the effect of IABP on in-hospital mortality for all PCIs, we redefined a list of baseline characteristics recognized as markers of mortality risk based on a previous study.5 Data analyses were performed using statistical software (SPSS, version 22.0; SPSS Inc). This study was approved by each participating hospital’s ethics review board (Keio University School of Medicine, Saiseikai Utsunomiya Hospital, Ashikaga Red Cross Hospital, Saitama City Hospital, Saitama National Hospital, Hino Municipal Hospital, Tokyo Dental College Ichikawa General Hospital, Tokyo Saiseikai Central Hospital, Tokyo Medical Center, St Luke’s International Hospital, Kawasaki Municipal Hospital, and Yokohama Municipal Citizen’s Hospital), and written informed consent was obtained from each patient.

Results | Baseline demographics in patients with and without IABPs are summarized in the Table. Overall, PCIs after ST-segment elevation myocardial infarctions and PCIs after non-ST-segment elevation myocardial infarctions or unstable angina accounted for 23.9% and 24.2% of the procedures, respectively. Before PCI, 486 patients (3.7%) and 900 patients (6.8%) manifested complications of cardiogenic shock and serious heart failure (New York Heart Association functional classification ≥3), respectively. The proportions of interventions for left main trunk and 3-vessel disease were 3.7% and 0.9%, respectively. Intra-aortic balloon pumps were inserted in 885 patients (6.7%). There were 134 in-hospital deaths (15.1%) among the patients receiving an IABP and 111 in-hospital deaths (0.9%) among the patients not receiving an IABP. In the crude analysis, the use of IABP was associated with an increased risk of in-hospital mortality (Figure, A).

Intra-aortic balloon pump use remained an independent predictor of in-hospital mortality after adjusting for baseline differences (odds ratio, 3.87; 95% CI, 2.71-5.52; P < .001). Among several subgroups thought to potentially have indications for IABP use, the use of IABPs was consistently associated with risk of in-hospital death (Figure, B), and IABP recipients had a worse baseline risk profile than nonrecipients (Figure, C). Notably, the risk of death appeared to be higher (with higher odds ratios) as the indications for IABP use became less established.

Discussion | Among a cohort of Japanese patients undergoing PCI in whom IABP use was frequent, we found that the use of IABP was associated with a higher risk of in-hospital death. This
Table. Baseline Characteristics of Patients With and Without Intra-aortic Balloon Pump Use in the Entire Cohort*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Patients Without IABP (n = 12,368)</th>
<th>Patients With IABP (n = 885)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean (SD), y</td>
<td>67.9 (10.9)</td>
<td>69.0 (11.7)</td>
<td>.004</td>
</tr>
<tr>
<td>Male sex, No. (%)</td>
<td>9807 (79.3)</td>
<td>695 (78.5)</td>
<td>.59</td>
</tr>
<tr>
<td>History of heart failure, No. (%)</td>
<td>1050 (8.5)</td>
<td>121 (13.7)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>NYHA functional classification ≥3, No. (%)b</td>
<td>645 (5.2)</td>
<td>255 (28.8)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Diabetes mellitus, No. (%)</td>
<td>5201 (42.1)</td>
<td>388 (43.8)</td>
<td>.28</td>
</tr>
<tr>
<td>Previous myocardial infarction, No. (%)</td>
<td>3050 (24.7)</td>
<td>183 (20.7)</td>
<td>.008</td>
</tr>
<tr>
<td>Previous PCI, No. (%)</td>
<td>4723 (38.2)</td>
<td>183 (20.7)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Previous coronary artery bypass graft, No. (%)</td>
<td>680 (5.5)</td>
<td>49 (5.5)</td>
<td>.96</td>
</tr>
<tr>
<td>Cerebrovascular disease, No. (%)</td>
<td>1078 (8.7)</td>
<td>114 (12.9)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Peripheral vascular disease, No. (%)</td>
<td>1059 (8.6)</td>
<td>58 (6.6)</td>
<td>.04</td>
</tr>
<tr>
<td>Chronic lung disease, No. (%)</td>
<td>376 (3.0)</td>
<td>30 (3.4)</td>
<td>.55</td>
</tr>
<tr>
<td>Hypertension, No./total No. (%)</td>
<td>9330/12,363 (75.5)</td>
<td>624/883 (70.7)</td>
<td>.001</td>
</tr>
<tr>
<td>Current or recent smoker, No./total No. (%)</td>
<td>4150/12,347 (33.6)</td>
<td>332/880 (37.7)</td>
<td>.01</td>
</tr>
<tr>
<td>Dyslipidemia, No./total No. (%)</td>
<td>8298/12,359 (67.1)</td>
<td>500/883 (56.6)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Renal dysfunction, No./total No. (%)c</td>
<td>4772/11,368 (42.0)</td>
<td>475/863 (55.0)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Urgent or emergent PCI, No. (%)</td>
<td>5130 (41.5)</td>
<td>773 (87.3)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Presentation, No. (%)</td>
<td>(n = 12,369)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STEMI</td>
<td>2612 (21.1)</td>
<td>551 (62.3)</td>
<td></td>
</tr>
<tr>
<td>NSTEMI</td>
<td>941 (7.6)</td>
<td>113 (12.8)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Unstable angina</td>
<td>2068 (16.7)</td>
<td>102 (11.5)</td>
<td></td>
</tr>
<tr>
<td>Stable angina or silent ischemia</td>
<td>6663 (53.9)</td>
<td>95 (10.7)</td>
<td></td>
</tr>
<tr>
<td>Other indication</td>
<td>84 (0.7)</td>
<td>24 (2.7)</td>
<td></td>
</tr>
<tr>
<td>No. of target vessels, No. (%)</td>
<td>(n = 12,358)</td>
<td>(n = 884)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>11,226 (90.8)</td>
<td>715 (80.8)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>2</td>
<td>1036 (8.4)</td>
<td>145 (16.4)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>3</td>
<td>96 (0.8)</td>
<td>24 (2.7)</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>10 (0.1)</td>
<td>1 (0.1)</td>
<td></td>
</tr>
<tr>
<td>LMT lesion, No. (%)</td>
<td>1006 (8.1)</td>
<td>203 (22.9)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Proximal left anterior descending artery, No. (%)</td>
<td>2886 (23.3)</td>
<td>298 (33.7)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Cardiogenic shock, No. (%)</td>
<td>206 (1.7)</td>
<td>280 (31.6)</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Abbreviations: IABP, intra-aortic balloon pump; LMT, left main trunk; NSTEMI, non-ST-segment elevation myocardial infarction; NYHA, New York Heart Association; PCI, percutaneous coronary intervention; STEMI, ST-segment elevation myocardial infarction.

A and B, Intra-aortic balloon pump use was adversely associated with patient outcome, regardless of situation, in crude (A) and multivariable (B) analyses. In the logistic regression model, adjustments were made using all variables exhibiting a bivariate association with the use of IABP with P < .001 in the Table, which included all variables except the following: diabetes mellitus, previous coronary artery bypass graft, chronic lung disease, stable angina or silent ischemia, and 1-vessel disease. C, For evaluating the baseline inequality index, we redefined a list of the following baseline characteristics that are recognized markers of mortality risk: age, cardiogenic shock, prior heart failure, peripheral vascular disease, chronic lung disease, renal dysfunction, NYHA functional classification of at least 3 at the time of percutaneous coronary intervention, and clinical presentation (STEMI or NSTEMI). LMT indicates left main trunk; NSTEMI, non-ST-segment elevation myocardial infarction; NYHA, New York Heart Association; and STEMI, ST-segment elevation myocardial infarction.
An unfavorable association was consistent across clinical settings and was more pronounced as the indications for IABP use became less established.

Several limitations need to be acknowledged. Because of the observational design, we cannot assume a causal relationship between IABP use and mortality. Despite rigorous risk adjustment, the possibility of confounding by unmeasured covariates remains. However, the consistency of the association between IABP use and mortality in various subgroups is notable. Our registry does not capture reasons for IABP insertion. Some physicians or patients may have declined IABP based on institutional or personal preferences.

Using a contemporary multicenter Japanese PCI registry, we have shown a negative association between IABP use and mortality. Our findings are consistent with the meta-analysis by Ahmad et al and suggest that it is time to reconsider the appropriate use of IABP therapy, a potentially life-saving but extremely costly and high-risk intervention for patients.

Taku Inohara, MD, PhD
Hiroaki Miyata, PhD
Ikuko Ueda, PhD
Yuichiro Maekawa, MD, PhD
Keiichi Fukuda, MD, PhD
Shun Kohsaka, MD, PhD

Author Affiliations: Department of Cardiology, Keio University School of Medicine, Tokyo, Japan (Inohara, Ueda, Maekawa, Fukuda, Kohsaka); Department of Health Policy and Management, Keio University School of Medicine, Tokyo, Japan (Miyata).

Corresponding Author: Shun Kohsaka, MD, PhD, Department of Cardiology, Keio University School of Medicine, 35 Shinnanomachi, Shintoku-ku, Tokyo 160-8582, Japan (kohsaka@cpnet.med.keio.ac.jp).

Published Online: November 2, 2015. doi:10.1001/jamainternmed.2015.5119.

Author Contributions: Dr Inohara had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. Study concept and design: Inohara, Kohsaka. Acquisition, analysis, or interpretation of data: All authors. Drafting of the manuscript: Inohara, Kohsaka. Critical revision of the manuscript for important intellectual content: All authors. Statistical analysis: Inohara, Miyata. Obtained funding: Inohara, Ueda, Fukuda, Kohsaka. Administrative, technical, or material support: Miyata, Ueda, Maekawa, Fukuda, Kohsaka. Study supervision: Miyata, Ueda, Maekawa, Fukuda, Kohsaka.

Conflict of Interest Disclosures: None reported.

Funding/Sponsor: This study was funded by grants 25460630 and 80571398 from the Japan Society for the Promotion of Science Grants-in-Aid for Scientific Research and by the Pfizer Research Foundation.

Role of the Funder/Sponsor: The funding sources had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.


Invited Commentary | LESS IS MORE
Is Increased Use of Mechanical Circulatory Support Devices Justified? A Cause for Concern

There has been a significant increase in the use of mechanical circulatory support devices in recent years. This increase has been largely due to the availability of several new percutaneous ventricular assist devices (PVADs). Khera et al documented in this journal a 30-fold increase in the use of PVADs based on National Inpatient Sample data from 2007 through 2012. In this issue of JAMA Internal Medicine, Inohara et al identify frequent use of the intra-aortic balloon pump (IABP) in Japan among patients with guideline-based indications and other less established indications. However, increased implantation of IABPs or PVADs is not supported by any evidence of clinical benefit or by professional guidelines.

Both Khera et al and Inohara et al demonstrate that the use of mechanical circulatory support devices is associated with increased mortality. The latter is an observational study from a multicenter Japanese registry of 13,253 patients undergoing angioplasty for various indications, with substantial heterogeneity among subgroups of the patients. Similar to some previous reports, the study by Inohara et al also showed that the use of IABPs is associated with higher in-hospital mortality overall and among various subgroups, including those with less severe disease. These data are consistent with several randomized clinical trials that have not shown benefit from IABP implantation. For example, IABP use has been found to have no survival benefit in patients with myocardial infarction-related heart failure or shock who receive thrombolysis or angioplasty. In hemodynamically stable patients undergoing high-risk angioplasty, there was no demonstrable difference in clinical outcomes or infarct size associated with the use of IABPs. A recent meta-analysis by Ahmad et al summarized data from major clinical trials and observational studies and concluded that IABP use did not improve mortality after myocardial infarction in patients with or without cardiogenic shock. Furthermore, IABP outcomes in those observational studies were better compared with controls only among lower-risk patients, questioning whether IABP use was ever indicated in those patients.

With increasing evidence showing no benefit in hard outcomes, enthusiasm for IABP use in guidelines seems to be waning. Recent European Society of Cardiology guidelines recommend against regular use of IABPs in patients with cardiogenic shock (class III). The guidelines also cite no mortality benefit of PVADs over IABPs in these patients and provide no definite
recommendation for their use. Despite the lack of guideline-based recommendations and little evidence to support IABP use, the study by Inohara et al.\(^4\) finds that IABPs continue to be used frequently and that their use is associated with increased in-hospital mortality.

Although there has been enthusiasm about newer PVADs (eg, Impella LP2.5 [Abiomed Europe GmbH] and TandemHeart [Cardiac Assist]), initial studies regarding their use to treat cardiogenic shock have not shown any significant survival benefit compared with IABPs and observed increased bleeding and a tendency toward more limb ischemia from the use of larger sheaths with PVADs.\(^7\) Similar to IABPs, no net benefit was demonstrated in hemodynamically stable patients with an implanted PVAD undergoing high-risk angioplasty, another common clinical scenario for the use of PVADs.\(^8\)

Why is there reluctance to abandon these invasive, expensive, and seemingly ineffective therapies? The answer might be multifactorial. Cardiogenic shock complicating myocardial infarction remains a formidable foe and is associated with 40% to 50% in-hospital mortality.\(^9\) In this setting, only early revascularization has shown improved survival. In some of these critically ill patients, it may seem reasonable to use mechanical circulatory support devices as salvage therapy. However, they offer little benefit in reducing clinical events, and have high costs and significant complication rates. Inohara et al.\(^8\) confirm previous findings that IABPs and PVADs are being increasingly used in patients without indications for their use. Although the precise reasons for such excessive use remain to be established, misaligned financial incentives might have a role. Furthermore, continued use of IABPs may be due to established routines or treatment protocols, with commission bias tending toward action rather than inaction.\(^10\)

Based on available data, the use of these invasive and expensive mechanical circulatory support devices should be critically appraised and limited because of significant complication rates associated with their use and a lack of evidence demonstrating any benefit. In the use of IABPs and PVADs, it seems appropriate to conclude that perhaps less is more.

Prakash Deedwania, MD
Tushar Acharya, MD

**Author Affiliations:** Division of Cardiology, Department of Internal Medicine, University of California San Francisco, Fresno.

**Corresponding Author:** Prakash Deedwania, MD, Division of Cardiology, Department of Internal Medicine, University of California San Francisco, 2335 E Kashian Ln, Ste 460, Fresno, CA 93721 (pdeedwania@fresno.ucsf.edu).

**Published Online:** November 2, 2015. doi:10.1001/jamainternmed.2015.6093.

**Conflict of Interests Disclosure:** None reported.


**Disparities in Time Spent Seeking Medical Care in the United States**

The Institute of Medicine identifies timeliness of care as a key aspect of quality. Racial and socioeconomic disparities exist in receipt of timely appointments and interventions.\(^1\) Patient time burden (ie, time spent traveling to, waiting for, and receiving ambulatory medical care) is a separate domain of timeliness. Disparities in this domain have received less attention, although prior work has described inequalities in pediatric emergency department wait time\(^2\) and racial disparities in the time adults spend seeking medical care.\(^3\) In prior work, using survey data on time associated with medical visits, we estimated that patients incurred $52 billion in opportunity costs obtaining medical care in 2010.\(^4\) In this article, we assessed how time associated with medical visits varied across socioeconomic variables and visit characteristics.

**Methods |** The American Time Use Survey data from 2005 to 2013 includes coded single-day 24-hour time diaries for 108 486 respondents 18 years and older.\(^5\) We identified respondents reporting *clinics time*, or time waiting for or obtaining medical care, on their interview day. We excluded respondents reporting more than 6 hours of clinical time as extreme outliers (n = 99), and we also excluded respondents receiving care for multiple individuals on their interview day (n = 101). For the remaining respondents with clinical time (n = 3787), we determined associated travel time, or time spent traveling for care, and total time, or the sum of clinic time and travel time. We compared these time estimates with *face-to-face* time, or time spent with a physician, collected from 2006 to 2010 by the National Ambulatory Medical Care Survey, a nationally representative survey of office-based physician visits (n = 150 022).

---

*JAMA Internal Medicine* December 2015 Volume 175, Number 12 1983

Copyright 2015 American Medical Association. All rights reserved.