Does higher hospital volume improve the patient outcome in acute pancreatitis?

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Over the past decade, many studies have shown a significant association between the volume of hospital services and patient outcomes for a wide variety of medical conditions [1–3]. As regards acute pancreatitis, several population-based studies have shown higher hospital volume to be associated with better outcomes [4–6]. Especially, a lower mortality rate, shorter length of hospital stay and lower total costs had been shown with higher hospital volume. However, acute pancreatitis has a wide range of severity and mortality; especially severe acute pancreatitis has a high mortality rate and longer length of hospital stay.

In clinical situations, several severity scoring systems have been used for judging the severity grading and making decisions for how to treat patients depending on the grading all over the world. Furthermore, various potentially effective treatments for acute pancreatitis, e.g. enteral nutrition, continuous hemofiltration, continuous regional arterial infusion, and endoscopic treatments, etc. are performed for severe acute pancreatitis. However, effectiveness and cost-performance analyses of those techniques have not been proven at this time. In addition, the mortality rate of each institution was not described, even for high volume centers. That is to say, a lot of clinicians have a great deal of concern about the volume–outcome relationship in order to perform effective treatments and decide referral patterns to improve mortality rates.

In the current context, Professor Hamada et al. [7] are to be congratulated for performing the extremely large-scale study about clinical outcomes of acute pancreatitis based on the Japanese administrative database associated with the diagnostic procedure combination system (DPC). This is the first study to have successfully adjusted for baseline disease severity using an established scoring system to evaluate the volume–outcome relationship in acute pancreatitis. Unlike other analyses, this study focused on the hospital–volume relationship and severity of acute pancreatitis based on the Japanese Severity Scoring system [8]. Additionally, the researchers include adjustments for severity grading and assessment of the potential non-linear relationship between hospital volume and outcomes by means of restricted cubic spline (RCS) functions. As a result, the median length of hospital stay was 14 days (range 10–22 days) in Japan. Their analysis demonstrated that the median hospital volume was 22.4 (range 1–82 case/year), and higher hospital volume was associated with shorter length of stay (overall relationship $p < 0.001$), however not evident in in-hospital mortality and total costs.

Using the same Japanese DPC system database, Murata et al. [8] showed that increased hospital volume, which was categorized into tertiles, was significantly associated with decreased relative risk of in-hospital mortality in both patients with mild and severe acute pancreatitis. Meanwhile Professor Hamada et al. used the annual number of cases, not categorized, admitted to each individual hospital and mentioned that the correlation between the patients in the same hospital can be taken into account with using generalized estimating equations (GEE). Exactly this groundbreaking method was performed.

So what is the key to have a better outcome and an effective utilization of medical resources? The clinical

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practice guidelines for acute pancreatitis recommend that severe cases with a ≥ 3 prognostic factor score should be transferred to a specialized medical institution [8]. The term specialized medical institution here is ‘high volume center’. Certainly, adequate severity grading and prompt referral are big issues for clinicians. Professor Hamada [9] also evaluated the Japanese Severity Scoring system as a useful tool for severity assessment. Clarification of the relationship between hospital volume and clinical outcome in patients with acute pancreatitis could contribute to studies of the quality of patient care. The nationwide work by Professor Hamada and colleagues will stand as a next important step in justifying evidence for the volume-based selective referral of acute pancreatitis patients.

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