Reviewer's report

Title: Marginal unit costs are falling as numbers of LVADs are growing:
Experiences from Oslo University Hospital

Version: 1 Date: 8 May 2012

Reviewer: Lars Lund

Reviewer's report:

This is an assessment of actual costs associated with LVAD implantation over time. This is important information.

However, in the current state there are several major problems:

1. Is the independent variable “time” binary (VA vs HVAD) or ordinal (implant nr 1 vs 2 vs 3 etc.)?

2. Clarity on hypothesis and conclusion. Please be very clear about the hypothesis, which variables changed over time, and whether the hypothesis was confirmed or not.

3. Statistics. There are no statistics to support the findings. Are the changes statistically significant?

Title:

unit cost? This is not an analysis of unit cost but of total implant cost

… as numbers of LVAD IMPLANTATIONS are INCREASING

Abstract:

The abstract is much much too long. Suggest shorter and more clear and concise, e.g.:

… consecutive implantation series of two 3rd generation Left Ventricular Assist Devices (LVADs).


Total cost .. per patient?

Costs: suggest compare e.g. total cost, length of stay and reimbursement for period 1 vs 2, with p-values, and then the regression.

Clarify regression – readers are clinicians. 14096 USD less cost for each additional patient. Would mean > 300000 USD less cost over the time period of 29 patients? Reasonable?

Abstract conclusion: sufficient with one or two sentences.
Background:

For consistency: LVAD, not VAD.

Cost effective: not true! The cited refs 5-7 suggest that cost effectiveness is WORSE than suggested norms (Western norms around 100,000 Euro per QALY). There is an editorial by Slaughter and Rogers that suggests that LVADs are nevertheless justifiable, and there is an older study by Hutchinsson that suggests that cost per QALY is something like 30-80,000 USD, but it cannot be said that LVAD is cost effective. Better to say that cost effectiveness is likely improving with time. This belongs in discussion.

Furthermore, this is a study about cost, not cost effectiveness. Therefore background should address previous literature on cost. See e.g. Slaughter J card surg 2011.

The aim was to expand cost analysis? Expand from what? Authors own previous work or other authors work. If so even more important to appropriately cite previous work on cost.

By Regression analysis etc. does not belong in introduction.

State clearly and sequentially aims and hypothesis.

What was the hypothesis? That total costs decline over time?

Methods:

Why is the pre-LVAD phase included? Is it relevant? Is there reason to believe that costs of pre-LVAD care have declined over time. The rationale and hypothesis for the different costs declining should be stated. If the authors hypothesized that all 3 phase costs have declined over time they should state the rationale for this.

Days on ECMO was entered into the regression to control for SELECTION bias? If aim is to control for selection bias, then surely age, renal function, organ failure, etc etc are also important?

If aim is to control for potential confounders with regard to outcome, then the same variables are important.

If aim is to control for confounders with regard to COST, then authors should include variables that affect cost. Methods should be expanded to discuss which variables are needed and which not to control for confounders with regard to cost.

If the aim was to facilitate comparison with DRG (which is discussed later in the methods), then this reason should be stated here.

Regression:

The background states that the aim was to … cost in two subsequent periods. The “periods” is a binary categorical variable. But analyses appear to consider
each consecutive implant, in which case the independent variable is an ordinal categorical variable and no distinction is made between early and late period.

Statistics:
There is only descriptive data. How does the reader know that the decrease in cost is statistically significant?

Results:
Please be consistent with numbers and punctuation: e.g. 385,941. Not 385 941.
Total costs excluded device costs? You mean excluding?
Table 2: unclear. Why only one column for Cost drivers pre-LVAD and LVAD phase? P-values?
Adverse events: How were they related to costs. This analysis seems possible to do.

Discussion:
Again, the authors are confusing with regard to cost vs cost effectiveness, which are very different things. There are no trials evaluating cost effectiveness of these two devices, but that is irrelevant, this paper do not do so either. The first paragraph in the discussion should very briefly summarize the findings in the study. Which costs fell over time and which changes were statistically significant?
USD 59,000 per QALY. This is the third place in the paper that cost effectiveness appears, each time giving different references. Please unify and be consistent. Cost effectiveness deserves brief mention in discussion but nowhere else because this work has nothing to do with cost effectiveness.

Level of interest: An article of importance in its field

Quality of written English: Needs some language corrections before being published

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:
Research funding to reviewer’s institution, consulting and speaker’s fees, from manufacturers of LVADs.