Improving clinical and cost outcomes in delirium: use of practice guidelines and a delirium care team

Webster J R, Chew R B, Mailliard L, Moran M B

Record Status

This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology

Use of clinical interventions based on clinical guidelines by a hospital-based physician/nurse delirium team in diagnosing and treating delirium. The clinical guidelines included tasks for medical doctors, nurses and discharge planner/social worker.

According to the guideline, all staff were involved at admission in recognising risk factors, and doctors and nurses were involved in diagnosing delirium.

Tasks for the medical doctors were as follows: diagnose and treat confounding medical illness; reduce and eliminate casual medication; initiate low-dose psychotropics for severe agitation; correct sensory deficits; consult social worker/discharge team; consult geriatric team; and consider dementia or depression work-up.

Tasks for the nurses were as follows: perform daily mental checks; daily weights; fall precautions; correct nutritional needs; adjust environment to needs; preserve routines; provide orienting stimuli; encourage family visits; family education/support; at bedtime - toilet patient, place urinal, call light, dentures, hearing aid and glasses nearby, put side rails up if indicated, clear walkway; treat confounding medical illness; monitor treatment efficacy; prevent falls, infection, etc.

Tasks for the discharge planner/social worker were: determine need for family meeting; identify aftercare needs; make referrals; ongoing family support and education.

Type of intervention

Diagnosis; Treatment.

Economic study type

Cost-effectiveness analysis.

Study population

The study population consisted of hospitalised patients who night nurses believed, and physicians confirmed, to be suffering from delirium . In Phase I, patients had to be aged over 59 years. In Phase II, patients had to be aged over 60 years. The only other selection criterion was that patients were not discharged within 48 hours.

Setting

The setting was secondary care, namely an urban university hospital. The economic study was conducted in Chicago, USA.

Dates to which data relate

The year to which effectiveness, resources and price data related was not stated. The study was published in 1999.

Source of effectiveness data
Effectiveness data were derived from a single study.

Link between effectiveness and cost data
Costing was undertaken prospectively on the same patient sample as that used in the effectiveness analysis.

Study sample
124 patients diagnosed with delirium were considered. Of these, 83 were diagnosed in Phase I of the study (22 in the standard care group and 61 in the guideline based intervention group), and 41 were diagnosed in Phase II of the study (12 in the standard care group and 29 in the guideline based intervention group). The split between control and intervention groups was based on the floor the patient was on: of the three floors considered, one was designated as control and two were interventional. Selection seemed to differ between groups. For the intervention group, it was stated that the doctors received the guidelines and made the diagnosis. For the control group, the physician investigator made the diagnosis by chart review and interview of nurses and doctors. However, one of the outcome measures was "documentation of delirium". Therefore, it appears that not all patients diagnosed with delirium were diagnosed by the authors' standard according to the guidelines. No power calculations relating to the sample size were reported. The baseline characteristics reported were as follows: average age 78 years, and an average Charleston index of severity of 2.9.

Study design
This was a two-phase, randomised, prospective single-centre controlled study. The duration of follow-up was not stated and no losses to follow-up were reported. House staff and nurses did not rotate between the three floors, but were permanently assigned to one site, thus preventing blinding of the team.

Analysis of effectiveness
The analysis of effectiveness was based on intention to treat. The main health outcomes used in the analysis were: documentation of delirium, use of physical restraints, use of neuroleptics, consultations with neurology/psychiatry departments, length of hospital stay, and mortality and nursing home placements post-discharge. The authors stated that groups were comparable in terms of age, sex, previous dementia, Charleston index of severity of illness, and living arrangements, although data by group were not given.

Effectiveness results
In Phase I, the results showed no statistically significant difference, although the level of significance was not given.

The proactive approach used in Phase II of the study resulted in significant differences in terms of documentation of delirium (control group 5 (42%), intervention group 29 (93%), ($p<0.01$)); a decreased number of neurology and psychiatry consultations (0 - 83% in the control group versus 7 - 24% in the intervention group); and a shorter length of stay (9.1 days in the control group, 7.4 days in the intervention group, ($p=0.03$)).

There were no statistically significant differences in nursing home placements post-discharge, use of physical restraints and neuroleptics, or mortality.

Clinical conclusions
In Phase I, there was no obvious difference in outcome between the groups. In phase two, documentation of delirium, consultation with neurology/psychiatry departments and length of stay greater than expected were statistically significantly better for the intervention.

Measure of benefits used in the economic analysis

The authors did not provide a summary measure of benefits and, as such, a cost-consequences analysis was performed.

Direct costs
DRG Medicare charges per day were used as a proxy for unit costs. The team costs for geriatrician and geriatric nurse technician were considered to be $135 per hour for the geriatrician and $31 per hour for the nurse. Costs were not discounted due to the short duration of the study. Resource quantities and unit costs were presented separately only for length of stay and charge per day, and for the team costs, as number of hours and costs per hour. The year to which Medicare charges related was not stated.

Indirect Costs
Indirect costs were not considered.

Currency
US dollars ($).

Sensitivity analysis
A sensitivity analysis was not conducted.

Estimated benefits used in the economic analysis
See effectiveness results above.

Cost results
The difference in average length of stay between the control and intervention groups was 1.7 days. Thus:

1.7 days x 29 patients = 49 days saved;

49 days x average Medicare charge per day of $2,400 results in savings of $117,600;

reducing this total by "allowances" plus 35% discount and deducting the $9,208 for the cost of the team, results in net savings of $57,132 for the intervention group.

Synthesis of costs and benefits
Costs and benefits were not combined.

Authors' conclusions
The authors stated that passive use of practice guidelines did not improve clinical outcomes in patients with delirium. "A brief, labour intensive, guideline-based intervention using a geriatric physician/nurse team, produced improved outcomes and cost savings."

CRD COMMENTARY - Selection of comparators
The reason for the choice of the comparator (standard care for patients with delirium) was clear, as both treatment approaches, guideline-based and standard care, were used in the authors' setting. However, as alluded to in the study sample field, it is not clear how the technologies differed, particularly in terms of diagnosis. If an outcome measure is "documentation of diagnosis", the implication being that technologies can differ in accuracy of diagnosis, then this ought to be clear.

Validity of estimate of measure of effectiveness

The analysis was based on a randomised, single-centre, prospective trial, which was appropriate for the study question. The study sample seemed to be representative of the study population, with some baseline characteristics being presented, but no power calculations being used in determining the sample size. The authors stated that patient groups were comparable in their baseline characteristics, but none of these were reported by group and the age criteria were different. Statistical analyses were conducted on effectiveness data, but the methods used were not stated and neither was level of significance. As already mentioned, with evidence lacking on baseline characteristics and doubt about the selection method, there is the possibility of selection bias. In fact, the authors identified as a limitation of the study the fact that the investigator made the diagnosis for both groups. Further confounding is likely due to the physician investigator being responsible for the treatment part of the intervention. In terms of measure of effectiveness, the relationship between health outcome and the measures used was not clear.

Validity of estimate of measure of benefit

The authors did not derive a summary measure of health benefit. Therefore, please refer to the commentary above.

Validity of estimate of costs

Medicare reimbursements were used as proxy for costs, which, as the authors stated, can be a necessary compromise when access to actual resource use and unit costs is difficult. However, the ability to generalise these results to any other setting is severely impaired. Also, there were no data on the resources used outside the hospital, for example by social services or community care or informal care, which could have been increased with decreased length of stay.

Other issues

Appropriate comparisons were conducted with relevant studies dealing with the same topic. The issue of generalisability of costs to other settings was not addressed, and no sensitivity analysis was conducted. The authors did not seem to present their results selectively. The authors stated that the main shortcoming of the study was the relatively small sample size. However, with method of selection lacking clarity and differing between groups, it is difficult to say to which population these results apply.

Implications of the study

The authors consider that further studies are needed with sufficient power to confirm the validity of the positive results of the present trial and to assess the long-term clinical outcomes in terms of decreased mortality and morbidity for patients with delirium. The methodological flaws identified above should also be addressed.

Source of funding

Part supported by a grant from the Northwestern Memorial Foundation.

Bibliographic details

Webster J R, Chew R B, Mailliard L, Moran M B. Improving clinical and cost outcomes in delirium: use of practice guidelines and a delirium care team. Annals of Long Term Care 1999; 7(4): 128-134

Other publications of related interest

Charleston ME, Pompei P, Ales KL, MacKenzie CR. A new method of classifying prognostic comorbidity in longitudinal studies: development and validation. Journal of Chronic Disease 1987:40;373-383.

Indexing Status

Subject indexing assigned by CRD

MeSH

Aged; Aged, 80 and over; Controlled Clinical Trials as Topic; Cost-Benefit Analysis; Delirium /diagnosis /drug therapy /prevention & control /economics; Geriatric Psychiatry; Health Care Costs; Health Services for the Aged; Humans; Long-Term Care; Practice Guidelines as Topic; Treatment Outcome

AccessionNumber
21999007649

Date bibliographic record published
31/03/2002

Date abstract record published
31/03/2002