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Promoting vision and hearing aids use in an intensive care unit

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Abstract

Vision and hearing impairments have long been recognised as modifiable risk factors for delirium.[1,2,3] Delirium in critically ill patients is a frequent complication (reported as high as 60% to 80% of intensive care patients), and is associated with a three-fold increase in mortality and prolonged hospital stay.[1] Guidelines by the UK Clinical Pharmacy Association recommend minimising risk factors to prevent delirium, rather than to treat it with pharmacological agents which may themselves cause delirium.[4] To address risk factors is a measure of multi-system management, such as sleep-wake cycle correction, orientation and use of vision and hearing aids, etc.[5]

We designed an audit to survey the prevalence and availability of vision and hearing aids use in the intensive care unit (ICU) of one university hospital. The baseline data demonstrated a high level of prevalence and low level of availability of vision /hearing aid use.

We implemented changes to the ICU Innovian assessment system, which serves to remind nursing staff performing daily checks on delirium reduction measures. This has improved practice in promoting vision and hearing aids use in ICU as shown by re-audit at six month. Further amendments to the Innovian risk assessments have increased the rate of assessment to 100% and vision aid use to near 100%.

Problem

The intensive care unit at the Bristol Royal Infirmary (BRI) consists of 16 ICU beds and eight HDU beds. It has a very high turn-over rate. It is not uncommon for patients to be moved between surgical/medical wards and HDU/ICU beds within a matter of a few days. This incurs some negative impacts such as the abrupt change of environment, which can precipitate the onset of delirium, and is particularly important for those who have pre-existing vision and hearing impairments.

The ICU/HDU environment itself has a few architectonic features, such as beeping alarms, flashing monitors, and walking/running steps in an emergency, which can be delirium prone and likely to aggravate isolation and disorientation for critically ill patients. This adds much more to those who have vision and hearing impairments.

We should note that patients admitted to ICU were not specifically assessed for vision and hearing aids prior to our original audit in 2011. Patients wore their aids on request only. There were a number of non-clinical incidents involving missing glasses and hearing aids during transfers, incurring complaints from families/relatives. If patients use their glasses and hearing aids at home to support their communication and daily activities, they would have experienced more difficulties in a new hospital environment with acute physical illness without their vision/hearing aids. This is also likely to increase their risk of falls, and compromise their rehabilitation. Furthermore, it costs a significant amount of money to replace missing hearing aids and glasses, adding unnecessary burden to the health service.

Background

Internationally, there is increasing awareness that management of delirium should focus on prevention strategies consisting of minimising risk factors, one of which is vision and hearing impairments.[6,7] Following this, pharmacological treatment may be required. There is very little evidence for the efficacy of drug therapy, and it is well known that drugs given to combat delirium may themselves cause delirium. There has been a case report of a patient admitted to ICU following trauma with contact lenses which were only removed 10 months later, when an ophthalmologist identified corneal epithelial defects and corneal neovascularisation.[8] This incident would have been prevented had there been a formal assessment tool in place.

In the ICU of BRI, all patients are screened for delirium and risk of delirium by the CAM-ICU test, which is designed to be used with patients receiving ventilator support. Many of the known risk factors for delirium are recognised and addressed well through measures such as daily sedation hold for sedated patients, and intentional rounding for non-sedated to improve care quality and reduce incidence of delirium. However, there seemed to be little attention given to addressing problems of vision/hearing aids use. It is likely that this is regarded as common sense, and has not been perceived as a potential problem.

Guidelines by the UK Clinical Pharmacy Association for the detection, prevention, and treatment of delirium recommend that patients needing vision or hearing aids should have them available to wear at any time in their hospital stay.[4] From the point of current literature reviews, the attention of researchers in recent years has shifted from the treatment to the prevention of delirium to focusing mainly on associated risk factors, among which vision/hearing impairment has always been mentioned as a potentially modifiable risk factor.[1,2,3]

Baseline measurement

The initial audit uncovered a very low availability of vision aids at the bedside for those patients with vision impairments, and none of the patients was questioned about vision/hearing impairments on admission. Twenty percent of those with vision impairment (83% of prevalence) had their glasses available at their own request. There were no hearing aid users on baseline data (reflecting a small sample) which might have under-represented the actual prevalence of hearing impairment.

On the initial audit presentation, our multidisciplinary team analysed the potential causes for the low availability of vision aids. It concluded that the major fault arose from a lack of assessment in this area.

Design

We conducted a prospective individual patient and/or next of kin (NOK) questionnaire survey. Random sampling was not considered necessary. NHS ethics approval was not required.

Potential participants in the study were consecutive patients admitted to the ICU department at the BRI from January to February 2011. A total number of 48 patients and/or their NOK participated in the initial survey. No one was excluded or declined to participate. Informed consent for participation was obtained orally from the patient, or for those who were ventilated or with substantial cognitive impairment, from a proxy (usually the nominated first contact of NOK), according to the proposal.

The screening interview included two parts, concentrating on vision and hearing impairment respectively (please refer to supplementary material 1). A person was counted as visually impaired if he/she required to use glasses/contact lenses for daily activities. The reasons for not having vision aids in hospital were recorded. If a visual aid was felt not needed by the patient or was needed for reading only, then the person was not counted as a vision aid user. Similar format and rules were applied to hearing impairment. A person was counted as having hearing impairment if he/she needed hearing aids for basic communications. Simple demographic data were also collected. These included the patient's date of birth, hospital number, and date of survey.

The collected data were analysed using Microsoft Excel by two auditors working independently. Any discrepancy in results had been resolved by re-checking the raw data. After each cycle of auditing, changes had been implemented. Forty eight consecutive ITU admissions in 2012 and 2014 were assessed using the same methodology.

Strategy

We adopted the approach of continuous auditing. Changes were made based on the results of each cycle.

The initial MDT audit meeting after the first cycle, had made a new assessment section incorporated into the ICU Innovian proforma (please refer to supplementary material 4). This formalised vision/hearing impairment assessment and made it a mandatory task at each nursing shift (three shifts in a 24 hour basis).

Six months after the first intervention, the second audit was performed. This had demonstrated a significant improvement in practice, albeit still rooms to be improved. Further amendments of vision/hearing impairment evaluation were put into the Innovian fall risk assessment after dissemination of the second audit results (please refer to supplementary material 5). This was an extra reminder to ensure that visual/hearing impairment assessment was performed at every shift, and visual/hearing aids made available to wear at the bedside.

We performed the third audit 12 months after the second intervention, achieving a much better outcome. Future plans to maintain sustainability were proposed and agreed in the latest MDT meeting.

Results

In all three audit cycles have been completed (please refer to supplementary material 2 and 3 for detailed results). The prevalence of vision impairment was high (83%, 83%, and 78% respectively). A small number of patients wore contact lenses (6%, 2%, and 2% respectively).

The availability of vision aids was low at the first audit (20% only). This has been improved remarkably following changes made after each cycle (75% and 97.4% - please refer to supplementary material 3). Not being assessed was the reason for low availability in the first and the second audit. On the third audit, one patient was not able to have her glasses on time because she had no NOK to bring in.

Overall, the figure of hearing aid wearers was much lower than that of glasses wearers (0%, 6.37%, and 12.5% respectively). The low percentage of hearing aid users would require a much larger sample to represent a true picture of prevalence.

The availability of hearing aids was not able to comment in the first audit as no patient was using it, although no one was formally assessed for hearing aid use. The availability was 100% at the second audit cycle, and was maintained at 100% on the third audit.

No single patient was assessed for vision/hearing aids use at the first audit. The Innovian new proforma has improved the rate of assessment to 81% at the second cycle, and 100% at the third (please refer to supplementary material 3).

See supplementary file: ds4279.doc - "supplementary material"

Lessons and limitations

The first intervention to assess vision/hearing impairment and aid use at the end of every nursing shift had made a significant

improvement in practice. Continuous auditing and MDT discussion had added vision/hearing impairment assessment at the start of every nursing shift. This has contributed to a 100% of assessment rate, and near 100% of aid availability.

The biggest learning point throughout this project was the efficacy of collaborative working, which brought about the successful changes made in practice. The interventions were generated and discussed among the MDT members -including nurses, doctors, health care assistants, physiotherapist, catering, and managerial staff. It worked perfectly well because everyone was involved in the decision-making process, and was motivated to work at the plan made in the MDT audit meeting.

This project has successfully demonstrated that it does not necessarily involve great cost to improve practice. The relatively small changes made in the Innovian document system (monetary cost was negligible) has significantly improved patients' experience during an ICU stay.

This project has made improvement to the current practice, ensuring all ICU patients are assessed for and offered use of vision/hearing aids. However, it does not provide evidence on whether this has indeed reduced delirium occurrence, nor increased patients'/relatives' satisfaction. As delirium is never caused by a single factor, quantifying the weight of vision/hearing impairment contributable to delirium is almost impossible. Nevertheless, it is certainly a useful topic to investigate patients'/relatives' views on the importance of visual/hearing aids accessibility during ICU admission, and their level of satisfaction with our practice changes.

A weak point of this project is that the sample was small, and the vigour could have increased if a larger sample was collected. This was reflected in the baseline prevalence of hearing aid use (0%) which made subsequent comparison non-inclusive.

It should be noted that the definition of vision impairment can vary a lot and reflects a spectrum of severity. This audit did not intend to give a cut off point of visual acuity in order to define visual impairment, but rather focus on how much patients were dependent on its use for their daily activities. Future audits using a clear definition from the start will improve the validity of prevalence result on vision aid use.

It may not be appropriate to wear glasses/hearing aids in ICU, such as during day resting time, patients on non-invasive facial mask ventilations, or after basal skull injury with cerebrospinal fluid leak from ears, etc. However, there were no such situations encountered in our audit sample.

A plan was made and agreed at the recent MDT meeting that ICU nurse-in-charge will perform periodical checks on vision/hearing aid use, maintaining sustainability of established good practice.

Conclusion

Two small interventions after each audit cycle have made a significant difference in ICU practice in the BRI, and have contributed to the promotion of a delirum-friendly environment by ensuring that vision/hearing impairment has been assessed and aids provided.

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Declaration of interests

Nothing to declare.

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