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A Computerised Decision Aid for Treatment of Acute Stroke with Thrombolysis (COMPASS)

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Background and aims: Thrombolysis (clot-busting medicine) reduces the likelihood of long-term disability caused by acute ischaemic (blocked artery) strokes and must be given to patients within 4.5 hours of symptom onset. On average 14 out of 100 patients treated with thrombolysis will completely recover or have minor disability who would otherwise be moderately or severely disabled. However, there is a risk of severe disability or early death from bleeding, the most serious being intracerebral haemorrhage (SICH) which occurs on average in 3 in every 100 patients within 24-36 hours. However, benefit to harm ratios vary considerably between patients, and there is wide unwarranted variation in use of thrombolysis. Our aim was to develop a robust evidence-based tool to assist clinicians with weighing-up the value of offering thrombolysis to an individual patient, and to support rapid clinical communication of individualised benefits/risks to patients/relatives and to better engage them in rapid decisions on thrombolysis.

Methods: A review identified robust sources of evidence for prediction of outcomes for treatment of acute stroke with and without thrombolysis to construct a decision analytic model (DAM). The DAM expresses outcomes as a function of 13 patient characteristics and was embedded into a prototype COMPuterised decision Aid for Stroke thrombolysiS (COMPASS) presented on a tablet PC. Interface design and methods of presenting probabilistic information (numerically and graphically) were informed by a critical review of tools to support patient understanding and decision making about thrombolysis, and an iterative co-design process with patients/relatives and clinicians. COMPASS expresses predicted outcomes (SICH, death, and extent of disability) with and without thrombolysis. Outcomes are presented numerically (percentages and natural frequencies) and graphically (pictographs, bar graphs and flowcharts). We then tested COMPASS in the real life clinical setting in three hospitals. Clinicians' experience with use of COMPASS was assessed using self-completion forms and interviews. Computer logged data assessed time in use, and utilisation of graphical risk presentations and additional features. Patients'/relatives' experiences of discussions supported by COMPASS were explored using interviews.

Results: COMPASS was used in total on 25 occasions in the clinical pilot. On 15 occasions it was used to support clinical decision making. Graphical risk presentations were shared with 14 patients/relatives (primarily after infusion of thrombolysis to reinforce verbal information conveyed prior to treatment). Clinicians reported benefits in communicating patient-specific predictions with patients/relatives. The median time in use was 2.8 minutes. Interviews with patients (n=2) and relatives (n=6) revealed that graphical risk presentations (specifically pictographs) facilitated understanding of the trade-offs between the benefits and risks of thrombolysis. No adverse effects related to use of COMPASS were identified.

Conclusions: COMPASS was acceptable to patients, relatives and clinicians and supported better decision making. We are in the process of wider piloting and implementation of COMPASS in the UK NHS and European Union health services in partnership with an independent software company. This includes an update policy to sustain potential impact of COMPASS on clinical practice over time including an associated clinical training package.