

Simulation Based Learning for Acute Kidney Injury: An effective educational method to improve medical student understanding and confidence?

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Background: An NHS England report highlights Acute Kidney Injury (AKI) and Sepsis as two national clinical priorities, concluding “improving care in these areas would have the biggest potential impact in reducing premature mortality”¹. Despite national prioritisation healthcare professionals often lack confidence and understanding about AKI and its management². Such shortcomings have contributed to common deficiencies in AKI care, including those highlighted in the 2009 NCEPOD report³. AKI complicates acute illness in all clinical areas meaning newly qualified doctors encounter AKI early in their careers. Furthermore these doctors are assigned roles fundamental to AKI recognition and its management, including daily review of medications, fluid balance and blood results. National strategies to promote safe and quality AKI care should thus include medical students (MS), so they are prepared to deliver timely and effective AKI care soon after qualification.

Previously we presented a survey of 50 MS in 2017 which found they felt less well prepared to manage AKI than sepsis⁴; a “comparator syndrome” associated with similar adverse outcomes and national prioritisation. Lecture-based undergraduate teaching has traditionally focused upon “complex” renal diseases, with less emphasis on practical AKI care. Simulation-based learning (SBL) promotes critical thinking, communication and decision-making skills^{5 6}, all fundamental to AKI care. Furthermore SBL enables students to experience clinical responsibility and identify learning opportunities in a safe environment⁷. We hypothesized SBL would enable pragmatic and effective AKI training for MS, providing clinical context and addressing areas of low confidence.

Methods: We repeated an anonymised internet-based survey to evaluate AKI knowledge and confidence amongst our current final year MS cohort, prior to and after delivery of a novel AKI-SBL programme. We tailored our AKI-SBL programme to address learning needs highlighted by our 2017 MS cohort. AKI-SBL comprised of 3 scenarios: (1) AKI in the context of diarrhoeal illness and hypotension, (2) AKI in the context of sepsis and multi-organ failure and (3) decompensated heart failure in a patient readmitted to hospital after cardiac medications were stopped during a recent AKI episode.

Results: 48 final year MS completed a pre-SBL survey in December 2019. Results replicated themes reported by our 2017 MS cohort. Compared to sepsis, MS reported less previous training, less self-rated understanding (5.7 v 7.3 / 10) and confidence (4.4 v 5.9 / 10) about AKI. Groups of 6 MS begun completing AKI-SBL sessions in January 2020; post-SBL surveys to date demonstrate improved AKI understanding and confidence. Of note SBL appears effective at addressing topics which both 2017 and 2019 MS cohorts perceived as difficult after conventional renal teaching; “fluid balance” and “drug dosing” during AKI and “indications for renal referral”.

Conclusion: We have found SBL an effective educational method to help final year MS feel better prepared to manage AKI. Our evaluation found AKI-tailored SBL was well received by MS and suggests SBL may be

superior to conventional renal teaching at addressing pragmatic topics fundamental to safe and quality AKI care. We plan to share and evaluate impact of our AKI-SBL programme amongst MS at other universities.