9 Self-Directed Blended Learning- Novel Tool To Teach Neonatal Bag-Mask Ventilation To Students

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Background: Newborn mortality accounts for over 40% of under-5 deaths. Majority neonatal deaths occur in low and middle-income countries where birth asphyxia contributes to around 1/3. Trainings in Basic Neonatal Resuscitation (BNR) help reduce newborn mortality and is acknowledged as a core competency expected from a medical graduate. Bag-Mask Ventilation (BMV) is the most crucial skill in the BNR. Traditionally, standard DOAP (Demonstrate-Observe-Assist-Practice) is the instruction method recommended by the Indian National Medical Commission for skill-learning. In absence of a standard established training method, many medical schools resort to a 1-day training workshop module which is a resource intensive exercise.

Objectives: To evaluate the effectiveness of Self-Directed Blended Learning using video based tutorials as a novel tool to transfer Neonatal BMV skills to undergraduate (MBBS) medical students.

Methods: We randomly selected 2 clinical batches of medical students in a teaching public hospital. Consenting students underwent the learning session consisting of a video tutorial of BMV depicting correct rate, pressure, identification of ineffective ventilation and troubleshooting; and one-on-one guidance only for correct positioning of mask over the manikin. No hands-on training was provided to avoid inadvertent conversion of the blended self-directed learning into a traditional DOAP method of training. Pre- and post-test included an OSCE-based evaluation of BMV skills and a self-administered e-survey assessing their confidence about several aspects of BMV.

Results: Of the 32 consenting medical students, none had received any prior training in neonatal resuscitation. In the pre-test, only 3% passed the OSCE, 6% reported an above average (score of >3 on a scale of 1 to 5) confidence score in administering correct rate and pressure and 16% in identifying and troubleshooting ineffective ventilation. In the post-test, 97% passed the OSCE and reported an above average confidence score in overall BMV, in administering correct rate and identifying ineffective ventilation ($p<0.0001$). 100% students reported above average confidence in administering correct pressure and individual ventilation corrective steps ($p<0.0001$).

Conclusion: Self-directed blended learning involving video tutorial and a brief contact session was effective in teaching the BMV skills to medical students, enhanced their confidence and saved the time and human resources.

10 Artificial Intelligence is Capable of Accurately Detecting OMI in the ED

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Background/Objectives: The STEMI/NSTEMI paradigm has long been accepted as the strongest indicator of acute coronary occlusion. However, 25-30% of NSTEMIs have unrecognized acute total occlusion; conversely, 15-35% of STEMIs are found to be false positives with no culprit lesion. There has been a shift towards a replacement paradigm, known as occlusion myocardial infarction (OMI), that includes ST-elevation in the criteria, among other ECG findings, to determine the need for reperfusion. A novel AI has since been developed presumed to improve the detection of OMI compared to using STEMI criteria alone.

Methods: We conducted a retrospective chart review to evaluate an AI ECG model's ability to detect OMI in high-risk acute coronary syndrome patients presenting to an urban, academic, tertiary care ED. The study period was from 11/24/23 to 7/24/24. Patients were classified as Heart Alert (HA)—patients who did not meet STEMI criteria—or STEMI activations (patients who met STEMI criteria). OMI was defined as either: 1) acute culprit lesion with TIMI 0-2 flow and confirmed OMI on catheterization, or 2) presumed OMI with significant cardiac outcomes, including a) non-occlusive culprit lesion with a High Sensitivity Troponin I (hsTnI) >1000, b) no angiography but elevated hsTnI and new wall motion abnormality on echocardiography, or c) STEMI-positive ECG with death before catheterization. We collected demographic and clinical data. Data analysis was performed using descriptive analytics.

Results: From the current dataset, 160 patients with apparent ACS were included. Of these 160 patients, 94 ultimately had OMI, of which 30 were Heart Alert patients and 64 were STEMI activations. The sensitivity of the AI tool in detecting OMI in the HA and STEMI activation groups was 73% (22/30) and 84% (54/64), respectively. The combined sensitivity of both the HA and STEMI activation groups was 81% (76/94). Between the HA and STEMI activation data, there were 18 false negatives (8 HA, 10 STEMI) where the AI tool incorrectly missed an OMI. The specificity of the AI tool in the combined HA and STEMI activation group was 70%.

Conclusion: In this small cohort of high-risk ACS patients presenting to the ED, the AI was able to detect 81% of OMIs based on initial ECG. Future prospective studies are necessary to confirm these results. Furthermore, comparative studies of AI vs human interpretation may be meaningful in delineating the clinical impact of this novel tool.