Outcomes following implementation of point-of-care testing (POCT) for influenza in the Emergency Department of a tertiary referral hospital in Ireland.

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Background

Seasonal influenza causes significant morbidity and mortality, and represents a recurring financial burden for community and hospital-based treatment[1,2]. Nosocomial outbreaks exacerbate the impact of influenza. Rapid diagnosis of influenza has been shown to reduce transmission. However, point-of-care testing (POCT) in emergency departments (ED), and prudent direction of patients with the virus to reduce hospital-acquired infection (HAI), have not been evaluated widely. We evaluated the Abbott ID NOW™ A&B 2 as a POCT in our ED.

Methods

Records of POCT and laboratory testing for the 2017/2018, 2018/2019 and 2019/2020 influenza seasons were analysed. All adult patients who had undertaken a POCT for influenza or tested positive for influenza in the three seasons were included in the analysis. Sensitivity and specificity of POCT were compared pairwise with Xpert Flu A/B/RSV. We analysed the number of confirmed healthcare-associated influenza (HCAI) during the peak of the three influenza season. Patient admission rates and time of waiting for admission were compared.

Results

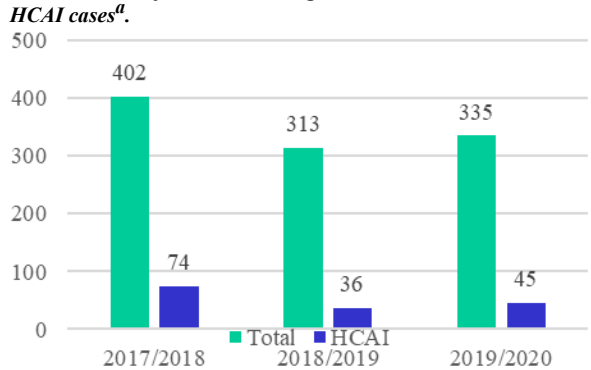
In Ireland, the reported peak influenza season lasting 14 weeks, 9 weeks and 12 weeks for the 2017/2018, 2018/2019 and 2019/2020 seasons, respectively. There was no significant variance in laboratory tests requested across the three influenza seasons.

Table 1. Performance characteristics of POCT against the Xpert Flu A/B/RSV

	Sensitivity, % (95% CI)	Specificity, % (95% CI)	Positive predictive value, % (95% CI)	Negative predictive value, , % (95% CI)
Influenza A	90.6 (78.6-96.5)	99.23 (95.2 - 100)	97.8 (95% CI 87.8 – 99.9)	96.3 (91.1 – 96.6)
Influenza B[a]	100% (67.9 – 100)	93.64 (88.6 – 96.6)	50 (28.8 – 71.2)	100 (97.1 – 100)

[a] only 11 influenza B cases were confirmed with pairwise testing laboratory testing

Chart 1. Total influenza cases diagnosed and observed reduction in HCAI cases[a].



[a] Total influenza cases included both laboratory and POCT confirmed cases. POCT introduced in 2018/2019.

The admission rate ratio from the ED to a ward bed for patients with POCT vs. a laboratory-based result (obviously with longer turn-around time) was 0.72 (95% CI 0.53-0.97, p=0.031). The availability POCT did not affect total admissions, total medical admissions or waiting times for a ward bed for admitted patients. There was no significant difference in 30-day all-cause mortality rate or ICU admission rate for influenza positive patients across all 3 influenza seasons.

Criteria for POCT testing for influenza

Patient who may have an influenza-like illness with:

Typical symptoms
- **Fever**
- **Cough**
- **Sore throat**

May also cause
- **Shortness of breath**
- **Headache**
- **Myalgia**

Point-of care testing for influenza to be considered in patients with influenza like-illness. Those patients should be isolated and/or asked to wear a mask pending clinical decision or test result.

POCT testing for influenza is not recommended for patients who do not have influenza-like illness.

Box 1. Patient testing criteria for use of ED POCT for influenza.

Discussion

- POCT had a positive impact on hospital operational management.
- The Abbott ID NOW™ A&B 2 assay demonstrated satisfactory performance characteristics in relation to practical implementation
- Observed absolute reduction in HCAI suggests earliy availability of influenza result can reduce HCAI across the hospital by improving appropriate bed placement within the ED.
- Lower admission rate ratio was observed for patients with a POCT result. This observation is consistent with other studies suggesting timely POCT results, even with sensitivities inferior to laboratory testing, can assist with clinical decision making[3-5].
- The last point is an important one. There is increasing level of interest globally to use the Abbott ID NOW™ COVID-19 test as a POCT for COVID-19. Mina et al. argued that consideration of the sensitivity and specificity alone should not dictate the adoption of a PCR assay [6]. In that context, our observations suggest that balance between sensitivity and the rapidity of results can result in positive clinical impact.

Conclusion

A user-friendly, easily operable POCT device, with rapid results for virus infection available directly to clinical staff, assisted in clinical decision-making and allowed appropriate isolation of patients with influenza. This resulted directly in associated reduction in hospital-acquired influenza infection.

References

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