Antiviral Use in Healthcare Workers – A Systematic Review

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BACKGROUND & OBJECTIVES

Neuraminidase inhibitors (NAIs) are likely to be part of the rapid response and control in situations of influenza pandemics and institutional outbreaks. Healthcare workers (HCWs) are at risk for acquiring and transmitting influenza infections due to their direct contact with patients. Furthermore, absenteeism due to influenza-like illness (ILI) among HCWs may cause a substantial disruption in healthcare services during a pandemic. Although several systematic reviews (SR) have assessed the use of NAIs, none has assessed NAI use in HCWs to date.

The aim of this SR is to identify and appraise the current evidence on the use of NAIs in HCWs in the context of an influenza pandemic.

METHODS

A study protocol was developed in conjunction with the Canadian Pandemic Influenza Preparedness Task Group (CPIP TG).

We searched PubMed, EMBASE, Web of Science, CINAHL and ClinicalTrials.gov, from January 1st, 1995 to October 29th, 2019 using the following terms and their derivatives: “Antivirals” OR “Neuraminidase inhibitors”; “Influenza” OR “Seasonal influenza” OR “Pandemic”; “Healthcare workers” OR “Healthcare settings”.

PICOTS

P: HCWs working in any healthcare setting
I: NAI, given to HCWs in pre/post-exposure to prevent infection with seasonal or pandemic influenza or as early treatment
C: No NAI use, or another strategy of NAI use (pre-exposure prophylaxis, post-exposure prophylaxis, early treatment)
O: Effectiveness of NAIs in preventing influenza and reducing influenza transmission between HCWs and between HCWs and their patients; reducing duration and severity of HCW influenza illness; and preventing disruption of healthcare services.
T: Influenza seasons or pandemics
S: All healthcare settings

Two reviewers independently screened all references, then proceeded to data extraction and quality assessment using the Cochrane tools for included studies.

RESULTS

We identified eight eligible studies through our systematic search of the literature. Four studies were randomized trials, three were cohort studies and one was a quasi-experimental trial. (Figure 1)

- All comprised HCWs and were conducted in healthcare settings: seven (87.5%) in tertiary care settings and outpatient centers and one (12.5%) in aged care facilities (ACFs).
- Oseltamivir and Zanamivir were the main NAIs assessed.
- Seven studies assessed the effectiveness of NAI prophylaxis in preventing influenza in HCWs.
- One study compared the effectiveness of two different NAI use strategies: treatment & prophylaxis vs. treatment alone.
- No study assessed the effect of NAIs in preventing healthcare service disruption.
- Prophylaxis seems to provide some limited protection against influenza in HCWs; however, no clear conclusions could be drawn from the available evidence.
- Most studies were underpowered to detect any significant effect.
- Compliance to NAI prophylaxis was high in 62.5% of studies, and very few HCWs discontinued the intervention because of adverse events, which means that NAIs can be well tolerated in this group

Included studies were deemed at low (25%), moderate (37.5%) and high risk of bias (37.5%) according to the Cochrane tools criteria. (Figure 2)

SUMMARY OF FINDINGS

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- Seven studies assessed the effectiveness of NAI prophylaxis in preventing influenza in HCWs.
- One study compared the effectiveness of two different NAI use strategies: treatment & prophylaxis vs. treatment alone.
- No study assessed the effect of NAIs in preventing healthcare service disruption.
- Prophylaxis seems to provide some limited protection against influenza in HCWs; however, no clear conclusions could be drawn from the available evidence.
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CONCLUSIONS

NAI prophylaxis seems to have a limited effectiveness in preventing influenza in HCWs. The paucity of data and the risk of bias associated with included studies prevents drawing clear conclusions regarding NAI use in HCWs. There is a need for more concrete data from experimental and observational studies.

LIMITATIONS

1. Data on antiviral use in HCWs are lacking and a limited number of studies were eligible for inclusion in this report;
2. The few eligible publications were either underpowered or at substantial risk of bias; 3. Influenza assessment was mostly based on self-reported symptoms and testing was only performed for symptomatic HCWs. This can cause substantial outcome measurement errors and bias the estimation of NAIs effectiveness;
4. Data were not available for all outcomes assessed in this review, such as the effect of antiviral treatment in reducing influenza severity, and NAIs’ effect in preventing healthcare service disruption;
5. Influenza vaccination, compliance to personal protective equipment (PPE) and hand hygiene were recommended in the majority of settings, which might have influenced the real effectiveness imputed to NAI use.

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