The Pediatric Infectious Disease Journal

Strikingly decreased community-acquired pneumonia admissions in children despite open schools and day-care facilities in Switzerland

--Manuscript Draft--

Manuscript Number:	PIDJ-220-1462	
Full Title:	Strikingly decreased community-acquired pneumonia admissions in children despite open schools and day-care facilities in Switzerland	
Article Type:	Letter to the Editor	
Keywords:	COVID-19; SARS-CoV-2; respiratory infection	
Corresponding Author:	Malte Kohns Vasconcelos University of Basel Children's Hospital: Universitats Kinderspital beider Basel Basel, SWITZERLAND	
Corresponding Author Secondary Information:		
Corresponding Author's Institution:	University of Basel Children's Hospital: Universitats Kinderspital beider Basel	
Corresponding Author's Secondary Institution:		
First Author:	Malte Kohns Vasconcelos, MD MSc	
First Author Secondary Information:		
Order of Authors:	Malte Kohns Vasconcelos, MD MSc	
	Patrick M. Meyer Sauteur, Md PhD	
	Kristina Keitel, MD PhD	
	Regina Santoro	
	Ulrich Heininger, MD	
	John van den Anker, MD PhD	
	Julia A. Bielicki, MD MPH	
Order of Authors Secondary Information:		
Manuscript Region of Origin:	SWITZERLAND	
Funding Information:	Schweizerischer Nationalfonds zur Förderung der Wissenschaftlichen Forschung (SNSF-ID 173532)	Dr Julia A. Bielicki

Strikingly Decreased Community-Acquired Pneumonia Admissions in Children Despite Open Schools and Day-Care Facilities in Switzerland

Malte Kohns Vasconcelos, MD, MSc,*† Patrick M. Meyer Sauteur, MD, PhD,‡ Kristina Keitel, MD, PhD,§¶ Regina Santoro,‖ Ulrich Heininger, MD,** John van den Anker, MD, PhD,* and Julia A. Bielicki, MD, MPH*,**

Correspondence: Malte Kohns Vasconcelos

Department of Paediatric Pharmacology, University of Basel Children's Hospital (UKBB)

Spitalstr. 33, 4056 Basel, Switzerland

Email: malte.kohns@ukbb.ch; Tel: +41-61-7042854

Cover Title: Reduced Pneumonia Admissions Despite Open Schools

Running head: Reduced CAP Admissions Despite Open Schools

Keywords: COVID-19, SARS-CoV-2, respiratory infection

*Department of Paediatric Pharmacology, University of Basel Children's Hospital (UKBB), Basel, Switzerland

†Institute for Medical Microbiology and Hospital Hygiene, Heinrich Heine University Düsseldorf, Düsseldorf, Germany

‡Division of Infectious Diseases and Hospital Epidemiology, University Children's Hospital Zurich, Zurich, Switzerland

§Paediatric Emergency Department, University Children's Hospital, Inselspital, University of Bern, Bern, Switzerland

¶Swiss Tropical and Public Health Institute, University of Basel, Basel, Switzerland

‖Ambulatory Study Centre, University of Basel Children's Hospital (UKBB), Basel, Switzerland

**Department of Infectious Diseases and Vaccinology, University of Basel Children's Hospital (UKBB), Switzerland

To the Editors,

During the first wave of the COVID-19 pandemic in Europe, several reports showed a distinct reduction in overall incidence of acute respiratory infections (ARI) in all ages.[1] Strict physical distancing measures were introduced in most European countries in March 2020. These measures included school closures. Distancing measures and the concomitant decrease in ARI incidence is also reflected by an abrupt end of seasonal ARI and particularly influenza in European countries.

We are currently studying the effectiveness of oral corticosteroids for shortening time to clinical stabilisation in paediatric patients who are hospitalised with community-acquired pneumonia (CAP) (ClinicalTrials.gov: NCT03474991[2]). The randomised controlled trial is conducted at eight paediatric hospitals across Switzerland that provide care to a substantial proportion of Switzerland's paediatric population. All patients from 0 to 18 years of age admitted at the participating hospitals with a clinical diagnosis or differential diagnosis of CAP are documented as pre-screened patients. Patients are also included in this documentation if they are identified retrospectively, i.e. through review of admissions during times when research staff was not on duty. We are thereby able to monitor paediatric CAP admissions representative for included regions in real time.

All trial sites have been active since autumn 2019. We saw a typically shaped distribution of CAP admissions for the 2019/20 ARI season (figure 1, left panel). In March 2020, when strict distancing measures and school closures were implemented to counteract the pandemic (overview of all previous and current measures listed online[3]), the number of admissions steeply declined. Based on observation of the previous year, an increase in admission would have been expected for October 2020. However, because of rising COVID-19 case numbers,[3] the Swiss federal government re-introduced stricter restrictions in mid to late October 2020 in a stepwise fashion, including advice to work from home and higher education moving to distance learning.[3] Importantly, schools and day care providers did not close. While median

CAP admission numbers from mid-September to mid-October did not differ between 2019 and 2020 (figure 1, right panel, paired t-test p=0.299), we observe that the expected seasonal rise in admissions has not yet occurred and in contrast, numbers have even shown some decline. Therefore, current 2020 admissions numbers are significantly lower (per site and week by about 67% on average) than in the respective period of 2019 (figure 1, right panel, paired t-test p<0.001).

Paediatric CAP admission numbers are mainly driven by children of preschool and primary school age.[4] CAP in this age group is rarely caused by SARS-CoV-2. Instead, other respiratory viruses with similar or higher secondary attack rates among children in schools or day care facilities with infective index patients are the main driver of paediatric CAP admissions.[5] The measures currently implemented in Switzerland, although not including school or day care closures, appear to lead to a considerable reduction in transmission of CAP-causing pathogens within the paediatric population.

Malte Kohns Vasconcelos, MD, MSc

Department of Paediatric Pharmacology, University of Basel Children's Hospital (UKBB), Basel, Switzerland

Institute for Medical Microbiology and Hospital Hygiene, Heinrich Heine University Düsseldorf, Düsseldorf, Germany

Patrick M. Meyer Sauteur, MD, PhD

Division of Infectious Diseases and Hospital Epidemiology, University Children's Hospital Zurich, Zurich, Switzerland

Kristina Keitel, MD, PhD

Paediatric Emergency Department, University Children's Hospital, Inselspital, University of Bern, Bern, Switzerland

Swiss Tropical and Public Health Institute, University of Basel, Basel, Switzerland

Regina Santoro

Ambulatory Study Centre, University of Basel Children's Hospital (UKBB), Basel, Switzerland

Ulrich Heininger, MD

Department of Infectious Diseases and Vaccinology, University of Basel Children's Hospital (UKBB), Switzerland

John van den Anker, MD, PhD

Department of Paediatric Pharmacology, University of Basel Children's Hospital (UKBB), Basel, Switzerland

Julia A. Bielicki, MD, MPH

Department of Paediatric Pharmacology, University of Basel Children's Hospital (UKBB), Basel, Switzerland

Department of Infectious Diseases and Vaccinology, University of Basel Children's Hospital (UKBB), Switzerland

References

1. Buchholz U, Buda S, Prahm K. Abrupter Rückgang der Raten an Atemwegserkrankungen in der deutschen Bevölkerung. *Epid Bull*. 2020:7–9.

2. Kohns Vasconcelos M, Meyer Sauteur PM, Santoro R. A randomised placebo-controlled multi-centre effectiveness trial of adjunct betamethasone therapy in hospitalised children with community acquired pneumonia – trial protocol for the KIDS-STEP trial. *BMJ Open*. Article in press

3. Swiss Federal Office of Public Health. Coronavirus: Measures and ordinances 2020. Available at: https://www.bag.admin.ch/bag/en/home/krankheiten/ausbrueche-epidemien-pandemien/aktuelle-ausbrueche-epidemien/novel-cov/massnahmen-des-bundes.html. Accessed 26/11/2020.

4. Parikh K, Hall M, Mittal V, et al. Establishing benchmarks for the hospitalized care of children with asthma, bronchiolitis, and pneumonia. *Pediatrics*. 2014;134:555-562.

5. O'Brien KL, Levine OS, Knoll MD, et al. Causes of severe pneumonia requiring hospital admission in children without HIV infection from Africa and Asia: the PERCH multi-country case-control study. *Lancet (London, England)*. 2019;394:757-779.

Figure legend:

Fig. 1: Weekly admission numbers for community-acquired pneumonia; left panel: total admissions at all study sites per calendar week, light grey and dark grey bars represent the weeks compared in the right-hand panel; right panel: CAP admissions per week and trial site in the four weeks from mid-September to mid-October (light grey boxes) and in the six weeks from mid-October to end of November (dark grey boxes), October-November 2019 on average 2.06 CAP admissions per week and site, 2020 0.67 per week and site, mean difference 1.40 (95% confidence interval 0.76, 2.03, $p<0.001$).

Figure

Click here to access/download;Figure;fig_PIDJ.png