

# Does acute lymphoblastic leukemia or its treatment help controlling asthma : a Belgian retrospective review

Geurten C.<sup>1</sup>, de Bilderling G.<sup>2</sup> Hoyoux C.<sup>3</sup>

<sup>1</sup> MD, Departement of Paediatrics, CHR Citadelle, Liege, Belgium <sup>2</sup> MD, Division of Pediatric Pulmonology, Department of Paediatrics, CHR Sambre et Meuse, Namur, Belgium <sup>3</sup> PhD, MD, Division of Paediatric hemato-Oncology, Department de Pédiatrie, CHR Citadelle, Liege, Belgium

## INTRODUCTION

- Association of chronic inflammatory respiratory conditions such as **asthma** and **viral induced-wheeze** with acute malignancies have rarely been studied in children. Little is known about how chemotherapy may affect respiratory symptoms and respiratory function in children affected with both conditions.
- An overall **decreased risk for malignancies** in children affected with asthma has been evoked.
- Another hypothesis suggests an enhanced **control** of asthma in children **on and off cancer therapy** through **immunosuppressive** effect of chemotherapy or **hygiene** measures imposed on patients on chemotherapy, reducing exposure to viral infections and other potential triggers
- As survival of childhood malignancies increases, practitioners are increasingly solicited by a new population of childhood cancer survivors whose chronic conditions require adequate management.

## MATERIAL & METHODS

- Medical files of patients diagnosed with acute lymphoblastic leukemia (**ALL**) in a tertiary centre in Belgium between 1987 and 2016 were reviewed to assess the prevalence of **asthma** or **viral-induced wheeze** in this population and to study their evolution and the need for **β2 agonists** and inhaled corticosteroid (**ICS**) before and after treatment of leukemia.
- Data were compared to those obtained in patients treated for neuroblastoma (**NBL**)

## RESULTS

	ALL		NBL	
	Prior to	After end of therapy	Prior to diagnosis	After end of therapy
<b>Sex</b> - M/F	65 (62,5%) / 39 (37,5%)		22 (43%) / 29 (57%)	
<b>Age (years)</b>	5,8 ( 0,125-16)		2,2 (0-15)	
<b>Respiratory condition</b>		<b>RR = 0,92, p= 0.03</b>		<b>RR = 3, NS</b>
- Asthme	2 (2%)	3 (3%)	0 (0%)	3 (6%)
- Viral-induced wheeze	4 (4%)	5 (5%)	1 (2%)	0 (0%)
- Upper respiratory tract infections	7 (7%)	2 (2%)	0 (0%)	1 (2%)
- Recurring non infectious cough	0 (0%)	2 (2%)	0 (0%)	0 (0%)
<b>Patients cured</b>	10 %		4 %	
<b>Development of a new condition</b>	10 %		6 %	
<b>Medication Use</b>				
- β2 agonist	6 (6%)	2 (2%) <b>RR = 0,33, p = 0.04</b>	1 (2%)	0 (0%) <b>RR = 3, NS</b>
- ICS*	2 (2%)	10 (10%) <b>RR = 5, NS</b>	0 (0%)	2 (4%) <b>RR = 3, NS</b>
<b>Atopy</b>	7 (7%)		5 (10%)	

- **General population** (Belgium) : 6-8,5% of asthma\*, 19,9% of viral-induced wheeze\*\*

## MAIN FINDINGS

- Prevalence of asthma and viral-induced wheeze is lower in patients diagnosed with malignancies and in survivors than in general population
- Relative risk (RR) of having a respiratory condition after treatment is significantly lower in patients with **ALL** than with **NBL**, probably due to the benefit of high-dose corticotherapy administered during induction of ALL therapy and due to the immunosuppressive effects of chemotherapy.
- Onset of new respiratory conditions is noted, but is similar to the prevalence of onset in the general population (natural evolution?)

### ALL

- ALL treatment influenced significantly the evolution of **viral induced wheeze** (all previous wheezers were weaned off reliever therapy) and **upper respiratory infections**, but not **asthma**
- Use of β2 agonist is significantly lower after ALL therapy
- **These effects** may be due to the use of **immunosuppressive drugs/corticosteroid** or merely be due to the **natural evolution** of the disease
- Viral-induced exacerbations were reported in 4% of patients **during therapy**
- We believe that even if hygiene measures are applied, the immunosuppressive effects of therapy maintain the patients at risk for respiratory infections

### NBL

- There were no significant effect of cancer therapy on respiratory condition or use of reliever therapy

## CONCLUSION

- There was a significant **positive influence of ALL treatment** in children suffering from a respiratory condition before therapy.
- This might be - at least in part - due to the effects of corticotherapy/immunosuppressive effects of therapy.
- Prospective studies are needed to confirm our hypotheses and further assess the relationships between respiratory conditions and ALL/NBL.

\*International Study of Asthma and Allergy in Childhood phases I and III

\*\* Tucson Children's Respiratory Study group (Halonen et al., 1999; Sherrill et al., 1999; Stein et al., 1999; Taussig et al., 2003; Morgan et al., 2005).

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Contact : Claire Geurten  
CHR Citadelle  
Département de Pédiatrie  
Email: [c.geurten@gmail.com](mailto:c.geurten@gmail.com)