Th1 and Th2 in Atopic children with nephrotic syndrome

Doaa M. Youssef 1, Amal S. El Shal2, Rabab M. Elbehidy1

1 Pediatric department, 2 Biochemistry department Faculty of Medicine- Zagazig university, Egypt

Introduction

After the first report of hypersensitivity and nephrotic syndrome (NS) by Hard ELIwicke (1) in 1959, numerous studies have reported an association between NS and allergy (2, 3).
One striking clinical association is with a personal or family history of atopy [4, 5] and serum IgE is typically elevated in MCN, both in the acute phase and during remission [4]. In particular, IL-13 shares many biological activities with IL-4, which include IgE isotype switching, CD23 induction, stimulation of eosinophil activity, mucus production and smooth muscle activity in the airway. This is due to the fact that they share a common IL-4 receptor a-chain (IL4RA) in the multimeric IL-4 and IL-13 receptor complexes [6]. Interleukin-4 (IL-4), which is produced by T-cells and mast cells, is the key cytokine involved in the development of atopy [7.8], being absolutely required for class switching of B-cells to IgE production and also promoting eosinophil chemotaxis and adherence (7).
Although pathogenesis of Idiopathic Nephrotic Syndrome (INS) remains to be elucidated, there are some evidences which suggest that is primary immune disease associated with immunoregulatory imbalance between T helper subtype 1 (Th1) and T helper subtype 2 (Th2) cytokines (9)

Aim

In this study we measured Th1 activity by measuring level of IL2, TNF alpha and Th2 activity by measuring IL4, IL13 both in activity and in remission to detect if there any privilege of Th2 over Th1 in pathogenesis of MCNS in children with atopy.

Subjects and methods:

This is a case-control study followed by longitudinal investigation after our patients entered into the remission phase.
We tested two groups; group I 42 children (24 males and 18 females) with steroid responsive nephrotic syndrome (SRNS); age range (3.2 to 9 years old), Group I divided into group I a (17) children with atopy and group I b (25) without atopy. Every patient was tested in activity and after remission
Group II 50 healthy children (24 males and 26 females) acting as control group with age ranged from 4 to 11 years old.

Atopy was diagnosed on the basis of positive family history, Clinical parameters of atopy, namely asthma, eczema, recurrent urticaria and allergic rhinitis, and serum IgE concentration.
All the patients were subjected to complete history taking, thorough clinical examination, and routine investigations as protein in 24 hours urine, serum albumin, and complete blood count, IgE level measured Th1 activity by measuring level of IL2, TNF alpha and Th2 activity by measuring IL4, IL13 both in activity and in remission.

Results:

Table (1): comparison between patients group and control in activity and in remission:

	Patients in activity	control	t	p	Patients in remission	Control	t	p
Age	5.8±2	5.4±2	0.637	**0.526**				
Proteinuria	95.1±19.8 (61-152)	2.29±0.5 (1–3.1)	21.3	**0.000**				
Serum albumin	1.8±0.7 (1-3)	4±0.2 (3.5-4.8)	19.8	**0.000**	3.9±0.38 (3.4-4.8)	4±0.2 (3.5-4.8)	1.3	**0.189**
TNFα (ng/mL)	2.8±0.38 (2-3.5)	1.09±0.26 (0.7-1.5)	26.7	**0.000**	1.18±0.25 (0.8-1.6)	1.09±0.26 (0.7-1.5)	1.84	**0.072**
IL2 (ng/mL)	2.89±0.99 (1.3-5)	2.94±0.95 (1-4)	-0.36	**0.72**	2.63±0.61 (1.3-4.2)	2.94±0.95 (1-4)	-1.43	**0.164**
IgE (IU/ml)	186±83.6 (70-340)	28.8±12.7 (9-52)	13.1	**0.000**	62.7±39.3 (18-143)	28.8±12.7 (9-52)	5.7	**0.154**
IL4 (pg/mL)	25.9±11 (6-45)	7.9±2.6 (4-12)	11.18	**0.000**	8.2±2.5 (4.1-15)	7.9±2.6 (4-12)	0.53	**0.579**
IL13 (pg/mL)	83.2±39.18 (28-173)	15.9±4.8 (9-23)	12	**0.000**	16.2±3.96 (9-22.3)	15.9±4.8 (9-23)	0.308	**0.759**

Table (2): comparison between atopic children and non-atopic ones in activity and in remission:

	Atopic patients In activity	Non-atopic patients In activity	t	p	Atopic patients in remission	Non-atopic patients in remission	t	p
Age	5.4±2	6.12±2	-0.999	0.324				
Proteinuria (mg/m²/h)	98.1±24.7 (60–150)	97.9±23.7 (59-158)	0.43	0.65				
Serum albumin	1.7±0.65	1.9±0.77	0.55	0.585	3.8±0.49	4±0.26	1.5	**0.137**
TNFα (ng/mL)	2.85±0.4 (2.1-3.5)	2.9±0.37 (2-3.5)	-0.48	0.628	1.14±0.23 (0.8-1.5)	1.2±0.26 (0.8-1.6)	-.896	**0.375**
IL2 (ng/mL)	2.8±1 (1.3-4.1)	2.9±0.9 (1.6-5)	-.292	0.77	2.95±0.52 (1.53-3)	2.73±.66 (1.3-4.2)	-1.2	**0.227**
IgE (IU/ml)	251.9±65.8 (13-340)	141.6±62.5 (70-200)	5.49	0.000	99.2±22.9 (50-143)	37.8±23 (18-67)	7.8	**0.000**
IL4 (pg/mL)	35.6±5.9 (28-45)	19.2±4.2 (6-37.2)	6.99	0.000	8.4±2.2 (6.5-15)	8.1±2.77 (4.1-14)	0.326	**0.746**
IL13 (pg/mL)	107.76±31.7 (50-173)	66.5±35 (28-67)	3.88	0.000	17.54±3.8 (10-23)	15.3±3.87 (9-21)	1.8	**0.075**

Conclusion:

We concluded that in atopic children with nephrotic syndrome both Th1 and Th2 play roles in initiating the disease, but we can suspect a more active role of Th2 especially in activity than after remission

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Youssef Doaa

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