**Online Repository Materials**

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| ***Table S1 – Details of demographic and clinical manifestations in 51 atopic primary immunodeficient patients*** | | | | | | | | |
| **Patient Number** | **Sex** | **Age**  **(year)** | **Age of onset**  **(year)** | **Clinical diagnosis** | **Atopic Manifestations** | | | |
| **Asthma** | **Allergic rhinitis** | **Atopic dermatitis** | **Food allergy** |
| 1 | Female | 11.0 | 0.5 | Combined Immunodeficiency |  |  | ⁕ |  |
| 2 | Male | 7.0 | 4.0 | Combined Immunodeficiency |  |  | ⁕ |  |
| 3 | Female | 12.0 | 2.0 | Combined Immunodeficiency |  |  | ⁕ |  |
| 4 | Male | 23.0 | 6.0 | Combined Immunodeficiency |  |  | ⁕ |  |
| 5 | Female | 12.0 | 3.0 | Combined Immunodeficiency |  |  | ⁕ |  |
| 6 | Male | 27.0 | 4.0 | Combined Immunodeficiency |  |  | ⁕ |  |
| 7 | Female | 5.0 | 1.0 | Combined Immunodeficiency |  |  | ⁕ | ⁕ |
| 8 | Male | 1.0 | 0.5 | Combined Immunodeficiency |  |  | ⁕ |  |
| 9 | Female | 2.0 | 0.7 | Combined Immunodeficiency |  |  | ⁕ |  |
| 10 | Male | 2.0 | 1.0 | Combined Immunodeficiency |  |  |  | ⁕ |
| 11 | Male | 3.5 | 1.5 | Combined Immunodeficiency |  |  |  | ⁕ |
| 12 | Female | 11.0 | 1.0 | Combined Immunodeficiency |  |  | ⁕ | ⁕ |
| 13 | Male | 30.0 | 14.0 | Combined Immunodeficiency |  |  | ⁕ |  |
| 14 | Male | 18.0 | 0.1 | Combined Immunodeficiency |  |  | ⁕ |  |
| 15 | Female | 24.0 | 22.0 | Combined Immunodeficiency |  |  | ⁕ |  |
| 16 | Male | 2.0 | 1.0 | Combined Immunodeficiency |  |  |  | ⁕ |
| 17 | Male | 2.0 | 1.0 | Combined Immunodeficiency |  |  |  | ⁕ |
| 18 | Male | 1.0 | 0.3 | Combined Immunodeficiency |  |  |  | ⁕ |
| 19 | Female | 2.5 | 1.0 | Combined Immunodeficiency |  |  |  | ⁕ |
| 20 | Female | 14.0 | 1.0 | Combined Immunodeficiency |  |  |  | ⁕ |
| 21 | Female | 7.0 | 1.5 | Combined Immunodeficiency |  | ⁕ |  |  |
| 22 | Male | 3.0 | 1.0 | Combined Immunodeficiency |  |  | ⁕ |  |
| 23 | Male | 3.0 | 1.0 | Combined Immunodeficiency |  |  |  | ⁕ |
| 24 | Male | 1.8 | 0.8 | Combined Immunodeficiency |  |  |  | ⁕ |
| 25 | Female | 5.0 | 1.0 | Combined Immunodeficiency |  |  |  | ⁕ |
| 26 | Female | 0.6 | 0.4 | Combined Immunodeficiency |  |  |  | ⁕ |
| 27 | Male | 5.0 | 1.0 | Combined Immunodeficiency |  |  |  | ⁕ |
| 28 | Male | 3.0 | 1.0 | Combined Immunodeficiency |  |  |  | ⁕ |
| 29 | Male | 1.0 | 0.3 | Combined Immunodeficiency |  |  | ⁕ | ⁕ |
| 30 | Male | 1.5 | 1.0 | Combined Immunodeficiency |  |  |  | ⁕ |
| 31 | Male | 2.0 | 1.0 | Combined Immunodeficiency |  |  |  | ⁕ |
| 32 | Male | 3.0 | 1.0 | Combined Immunodeficiency |  |  |  | ⁕ |
| 33 | Male | 0.7 | 0.3 | Combined Immunodeficiency |  |  |  | ⁕ |
| 34 | Female | 1.0 | 0.3 | Combined Immunodeficiency |  |  |  | ⁕ |
| 35 | Male | 6.0 | 1.5 | Combined Immunodeficiency |  |  |  | ⁕ |
| 36 | Female | 3.0 | 1.0 | Combined Immunodeficiency |  |  | ⁕ | ⁕ |
| 37 | Female | 1.5 | 1.0 | Combined Immunodeficiency |  |  |  | ⁕ |
| 38 | Male | 1.2 | 0.5 | Combined Immunodeficiency |  |  |  | ⁕ |
| 39 | Male | 19.0 | 7.0 | Common Variable Immunodeficiency |  | ⁕ |  |  |
| 40 | Male | 17.0 | 7.0 | Common Variable Immunodeficiency | ⁕ |  |  |  |
| 41 | Male | 4.0 | 1.0 | Common Variable Immunodeficiency |  | ⁕ |  |  |
| 42 | Male | 7.0 | 3.0 | Selective IgA Deficiency | ⁕ | ⁕ |  |  |
| 43 | Female | 1.5 | 0.6 | Severe Combined Immunodeficiency |  |  | ⁕ | ⁕ |
| 44 | Male | 1.0 | 0.3 | Severe Combined Immunodeficiency |  |  | ⁕ | ⁕ |
| 45 | Male | 0.7 | 0.3 | Severe Combined Immunodeficiency |  |  | ⁕ | ⁕ |
| 46 | Male | 1.0 | 0.3 | Severe Combined Immunodeficiency |  |  | ⁕ | ⁕ |
| 47 | Female | 1.8 | 0.7 | Severe Combined Immunodeficiency |  |  |  | ⁕ |
| 48 | Male | 0.1 | 0.0 | Leukocyte Adhesion Defect |  |  | ⁕ | ⁕ |
| 49 | Male | 21.0 | 5.0 | Chronic Granulomatous Disease | ⁕ |  |  |  |
| 50 | Male | 14.0 | 2.5 | Chronic Granulomatous Disease | ⁕ |  |  |  |
| 51 | Male | 0.8 | 0.3 | Chronic Granulomatous Disease |  |  |  | ⁕ |

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| **Table S2 – Summary of demographic, clinical, and laboratory findings in atopic patients with variable IEIs** | | | | | | | |
|  | **Total**  **(n=51)** | **CID**  **(n=38)** | **SCID**  **(n=5)** | **CGD**  **(n=3)** | **CVID (n=3)** | **LAD**  **(n=1)** | **SIgAD**  **(n=1)** |
| Age, median (IQR), months | 36.0 (18.0-132.0) | 36.0 (20.7-132.0) | 12.0 (10.2-19.8) | 168.0 | 204.0 | 1.2 | 84.0 |
| Age of onset, median (IQR), months | 12.0 (6.0-18.0) | 12.0 (7.8-18.0) | 3.6 (3.6-7.8) | 30.0 | 84.0 | 0 | 36.0 |
| Age of diagnosis, median (IQR), months | 24.0 (12.0-72.0) | 24.0 (12.0-66.0) | 7.2 (5.4-10.8) | 52.8 | 204.0 | 1.2 | 60.0 |
| Sex ratio, M/F | 34/17 | 23/15 | 3/2 | 3/0 | 3/0 | 1/0 | 1/0 |
| Family history of IEI, % | 10 (19.6%) | 9 (23.7%) | 1 (20%) | 0 | 0 | 0 | 0 |
| Food Allergy, % | 32 (62.7%) | 25 (65.8%) | 5 (100%) | 1 (33.3%) | 0 | 1 | 0 |
| Atopic Dermatitis, % | 21 (41.2%) | 16 (42.1%) | 4 (80%) | 0 | 0 | 1 | 0 |
| Allergic Rhinitis, % | 4 (7.8%) | 1 (2.6%) | 0 | 0 | 2 (66.7) | 0 | 1 |
| Asthma, % | 4 (7.8%) | 0 | 0 | 2 (66.7%) | 1 (33.3) | 0 | 1 |
|  |  |  |  |  |  |  | 0 |
| Total IgE (IU/ml), mean (±SD) | 350.9 (±926.6) | 383.1 (±1038.6) | 443.0 (±726.9) | 327.0 (±370.5) | 22.7 (13.2) | 11 | 135.0 |
| AEC × 103 (cells /µL),  mean (±SD) | 627.4 (±654.1) | 618.7 (±697.9) | 388.7 (±214.1) | 498.0 (±316.9) | 498.0 (322.5) | 2040 | 1233 |
| *IEIs; inborn errors of immunity, F; female, M; male, CID; combined immunodeficiency, CVID; common variable immunodeficiency, SCID; severe combined immunodeficiency, CGD; chronic granulomatous disease, LAD; leukocyte adhesion defect, Ig; Immunoglobulin, AEC; absolute eosinophil count, SD; standard deviation* | | | | | | | |

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| ***Table S3 – Details of laboratory data in 313 primary immunodeficient patients*** | | | | |
| **Atopic Manifestation** | | **IgE (IU/ml), mean (**±SD**)** | **WBC × 103 (cell/uL), mean (**±SD**)** | **Absolute eosinophils count (cells /µL),**  **mean (±SD)** |
| **Allergy** | Yes | 350.9 (±926.6) | 11.3 (±11.1) | 627.4 (±654) |
| No | 41.5 (±178.8) | 9.3 (± 5.0) | 426 (±438.9) |
| *p-value* | **<0.001\*** | 0.974 | **0.003\*** |
| **Asthma** | Yes | 245 (±304.3) | 11.3 (± 2.6) | 588.7 (±494.9) |
| No | 93 (±431.8) | 9.6 (± 6.4) | 454.3 (481.6) |
| *p-value* | 0.080 | 0.160 | 0.445 |
| **Atopic Dermatitis** | Yes | 693.7 (±1316) | 11.6 (± 11.3) | 798.5 (±886.9) |
| No | 44.8 (±174) | 9.5 (± 5.9) | 434.3 (±437.1) |
| *p-value* | **<0.001\*** | 0.890 | **0.005\*** |
| **Allergic Rhinitis** | Yes | 64.0 (±62.0) | 11.0 (± 3.6) | 817 (±443.7) |
| No | 95.0 (±432.8) | 9.6 (± 6.4) | 452.4 (±480.9) |
| *p-value* | **0.104\*** | 0.297 | 0.085 |
| **Food Allergy** | Yes | 132.9 (±314.6) | 11.4 (± 13.6) | 521.9 (±487) |
| No | 90 (±443) | 9.4 (± 5.1) | 449 (±481) |
| *p-value* | **0.007\*** | 0.159 | 0.247 |
| *Ig; Immunoglobulin, WBC; White blood cell, \* p-value is statistically significant <0.05* | | | | |