**Supplemental Digital Content 1.** Standard definitions used to diagnose single organ complications

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| **Complication** | **Definition used in the study** |
| Diarrhea | Presence of 3 or more liquid or loose stools in 24 hours Acute diarrhea lasting < 7 days, prolonged diarrhea lasting 7-14 days, or chronic diarrhea lasting > 14 days  |
| Pneumonia | Signs and symptoms of pneumonia, including high respiratory rate according to age, signs of respiratory distress, altered oxygen saturation and /or chest auscultation and a chest X-ray demonstrating lower respiratory infection. |
| Hepatitis | Defined by the increase of at least 2-times higher referral values according to age |
| Pancreatitis | Defined by the increase of by 3 or more times of lipase and/or amylase values based on Atlanta Criteria [Bai HX, Lowe ME, Husain SZ. What have we learned about acute pancreatitis in children? J Pediatr Gastroenterol Nutr. 2011;52(3):262-70.]. |
| Myocarditis | ECG and echocardiographic abnormalities compatible with acute myocarditis in concomitance with alteration of blood enzymes suggestive of myocardial cytolysis (myoglobin, troponin I, CK-MB, total CK) |
| Leukopenia | Leukocyte absolute count below normal values according to age: < 6000 (1-3 years), < 5.500 (4-7 years), < 4.500 (8-13 years), < 4000 adolescents and adults |
| Lymphocytopenia | Lymphocyte absolute count below normal values according to age: < 3500 (1-2 years), < 2300 (3-6 years), < 1500/ul (> 6 years) [Shearer WT, Rosenblatt HM, Gelman RS, Oyomopito R, Plaeger S, Stiehm ER, Wara DW, Douglas SD, Luzuriaga K, McFarland EJ, Yogev R, Rathore MH, Levy W, Graham BL, Spector SA; Pediatric AIDS Clinical Trials Group. Lymphocyte subsets in healthy children from birth through 18 years of age: the Pediatric AIDS Clinical Trials Group P1009 study. J Allergy Clin Immunol. 2003 Nov;112(5):973-80] |
| Neutropenia | Neutrophil absolute count < 1500/ul in children of Caucasian or Asian ethnicity and < 1200/ul in children of African origin |
| Thrombocytopenia | Thrombocyte count < 150.000 cells/ul |

**Supplemental Digital Content 2.** Flow chart diagram

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**Supplemental Digital Content 3.** Distribution of single complications according to study group

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| **Complications** | **Total****(n=108)** | **Vitamin A supplementation****(n=36)** | **Standard care****(n=72)** | ***p*** |
| Pneumonia | 51 (47.2) | 21 (58.3) | 30 (41.7) | 0.10 |
| Lobar pneumonia | 36 (33.3) | 14 (38.9) | 22 (30.6) | 0.38 |
| Interstitial pneumonia | 20 (18.5) | 9 (25) | 11 (15.3) | 0.22 |
| Diarrhea | 19 (17.6) | 10 (27.8) | 9 (12.5) | 0.05 |
| Respiratory failure/need of O2 therapy | 10 (9.3) | 2 (5.6) | 8 (11.1) | 0.34 |
| Hepatitis | 10 (9.3) | 4 (11.1) | 6 (8.3) | 0.63 |
| Otitis | 8 (7.4) | 2 (5.6) | 6 (8.3) | 0.60 |
| Laryngitis/Croup | 6 (5.6) | 1 (2.8) | 5 (6.9) | 0.37 |
| Pancreatitis | 4 (3.7) | 0 (0.0) | 4 (5.6) | 0.15 |
| Thrombophlebitis  | 2 (1.9) | 0 (0.0) | 2 (2.8) | 0.31 |
| Encephalitis | 1 (0.9) | 0 (0.0) | 1 (1.4) | 0.47 |
| Myocarditis | 1 (0.9) | 0 (0.0) | 1 (1.4) | 0.47 |
| Thrombocytopenia | 10 (9.3) | 3 (8.3) | 7 (9.7) | 0.81 |
| Neutropenia | 25 (23.1) | 7 (19.4) | 18 (25.0) | 0.51 |
| Lymphocytopenia | 35 (32.4) | 9 (25.0) | 26 (36.1) | 0.24 |

**Supplemental Digital Content 4.** Antibiotic and supportive treatments of children hospitalized for measles**.**

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| Drug prescription | Total(n=108) | Vitamin A supplementation(n=36) | Standard care(n=72) | *p* |
| Oral antibiotics, n (%) | 43 (39.8)\* | 17 (47.2)\* | 26 (36.1)\* | 0.37 |
| Amoxicillin-Clavulanate | 18 (16.6) | 6 (16.6) | 12 (16.6) |  |
| Amoxicillin | 12 (11.1) | 7 (19.4) | 5 (6.9) |
| Clarithromycin  | 11 (10.1) | 7 (19.4) | 4 (5.5) |
| Ciprofloxacin  | 4 (3.7) | 1 (2.7) | 3 (4.1) |
| Third generation cephalosporins | 2 (1.8) | 0 (0) | 2 (2.7) |
| Azithromycin | 1 (0.9) | 0 (0) | 1 (1.4) |
| TMP/SMX | 1 (0.9) | 0 (0) | 1 (1.4) |
| Intravenous antibiotics, n (%) | 25 (23.1)\* | 10 (27.7)\* | 15 (20.8)\* | 0.57 |
| Ceftriaxone | 14 (12.9) | 5 (13.8) | 9 (12.5) |  |
| Ceftazidime | 7 (6.4) | 3 (8.3) | 4 (5.5) |
| Ciprofloxacin  | 2 (1.8) | 1 (2.7) | 1 (1.4) |
| Meropenem | 1 (0.9) | 0 (0) | 1 (1.4) |
| Vancomycin | 1 (0.9) | 0 (0) | 1 (1.4) |
| Piperacillin- Tazobactam  | 1 (0.9) | 1 (2.7) | 0 (0) |
| Oral steroids, n (%) | 6 (5.5) | 3 (8.3) | 3 (4.1) | 0.40 |
| Intravenous Immunoglobulins, n (%) | 5 (4.6) | 2 (5.5) | 3 (4.1) | 1.00 |

**\***The number does not correspond to the sum of single antibiotic classes prescribed since some children received association of one or more antibiotics