Supplemental Table 1. The results of the systematic review in Japanese research console (Ichushi-Web)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Ref. | Area | N | Age | Sex, N | Preceding event, N | Durations of fever | Durations of other symptoms | Antibiotics,  N | Duration of  antibiotics | Blood glucose level,  mg/dL | free carnitine  level,  μmol/L |
| 1 | Japan | 1 | 1y6m | F | URI | N/A | 4 d | CDTR-PI, 1 | 11 d | 17 | 4 |
| 2 | Japan | 1 | 2y6m | F | OM | N/A | N/A | CDTR-PI/CFPN-PI, 1 | 16 d | 18 | 5.5 |
| 3 | Japan | 1 | 1y7m | F | N/A | N/A | N/A | TBPM-PI, 1 | 18 d | 15 | 5.1 |
| 4 | Japan | 1 | 1y3m | F | URI | N/A | N/A | CDTR-PI/CFPN-PI, 1 | 50 d | 12 | 9.6 |
| 5 | Japan | 1 | 2y1m | M | URI | 3 d | 14 d | CDTR-PI/CFPN-PI, 1 | 18 d | 12 | 0.73 |
| 6 | Japan | 1 | 1y | F | URI | N/A | N/A | CFPN-PI, 1 | 4 m | 12 | N/A |
| 7 | Japan | 1 | 1y | M | OM | N/A | N/A | TBPM-PI, 1 | 10 d | 7 | 15.9 |
| 8 | Japan | 1 | 1y3m | M | OM | N/A | N/A | CDTR-PI/TBPM-PI, 1 | 14 d | 25 | 2.5 |
| 9 | Japan | 1 | 1y2m | F | URI | N/A | N/A | CDTR-PI/CFPN-PI/CFTM-PI, 1 | 40 d | 20 | 9.0 |
| 10 | Japan | 1 | 3y0m | F | URI | N/A | >20 d | CDTR-PI/CFPN-PI, 1 | 22 d | 16 | 12.3 |
| 11 | Japan | 1 | 4y | M | URI | N/A | a few d | CDTR-PI/CFPN-PI, 1 | 52 d | 26 | 4.4 |
| 12 | Japan | 1 | 1y9m | M | OM | N/A | N/A | CDTR-PI, 1 | 10 d | 21 | 7.4 |
| 13 | Japan | 1 | 0y11m | M | URI, OM | N/A | 5 d | CDTR-PI/CFPN-PI, 1 | 27 d | 11 | 4.7 |
| 14 | Japan | 1 | 85y | F | bronchitis | 1 d | 1 d | CFPN-PI, 1 | 1 d | 42 | N/A |

Ref., Reference; y, year; m, month; M, male; F, female; URI, upper respiratory infection; AGE, acute gastroenteritis; LF, long fasting; AOM, acute otitis media; FMD, Fukuyama muscular dystrophy; d, day; CDTR-PI, cefditren pivoxil; CFPN-PI, cefcapene pivoxil; CFTM-PI, cefteram pivoxil; TBPM-PI; tebipenem-pivoxil

1. Kajiwara W, Tsuchiya S, Sasaki M, Takahashi A, Takasago Y, Maisawa S. Secondary carnitine deficiency due to pivalate-conjugated antibiotics diagnosed with tandem mass spectrometry: a case report. J Jpn Pediatr Soc 2017;121:1862-1866.

2. Hayashi T, Okayama Y, Ono S, Katayama T, Sugimoto S, Kaji S, et al. A patient with secondary carnitine deficiency presenting with ketotic instead of non-ketotic hypoglycemia. J Jpn Pediatr Soc 2016;120:1797-1801.

3. Nishiyama M, Tanaka T, Fujita K, Maruyama A, Nagase H, Takeda H,et al. A case of acute encephalopathy with secondary carnitine deficiency after taking pivalate-conjugated antibiotics for 3 days. J Jpn Pediatr Soc. 2014;118:812-818.

4. Teraoka M, Wada T, Ogura K, Yasuhara S, Kitamura T, Murakami N, et al. A Patient with hypocarnitinemia after long-term treatment of antibiotics. J Jpn Pediatr Soc. 2004;108:1059-1061

5. Yamada K, Kobayashi H,Endou M, Hasegawa Y, Shiraishi H, Yamaguti S. A case of 2-year-old boy with the secondary carnitine deficiency after taking cephem antibiotics with pivoxil moiety of 11 days. J Jpn Pediatr Soc. 2008;112:1382-1385

6. Ohura T. Secondary carnitine deficiency due to pivalate-conjugated antibiotics. Jpn J Dev Pharmacol Ther. 2013;26:14-17.

7. Matsunaga Y, Yoshikane M, Ooe M, Yoshida A, Mujika Y, Kanou H, et al. A case of ketotic hypoglycemia with secondary carnitine deficiency after antibiotic use. Kainan-Byoin-Gakujutsu-Zasshi. 2017;3:28-30.

8. Hayashida T, Sato T, Hamaguchi Y, Nakayama Y, Takase Y, Ito N, et al. A case of secondary carnitine deficiency due to long-term use of antibiotics. Nagasaki-Igakkai-Zasshi. 2015;90:254-257

9. Inoue M, Kawamura M, Iwama N, Kodama K, Ishida T, Takahashi T, et al. Case of a 14-month-old girl with carnitine deficiency caused by long-term treatment of pivalate-conjugated antibiotics. Akita-Ken-Ishikai-Zasshi. 2012;63:44-49

10. Nakatani K, Nakachi T, Hitaka F. A case of hypoglycemia with low levels of serum carnitine due to continuous use of pivalic acid conjugated antibiotics. Miyazaki-Igakkai-Zasshi. 2008;32-49.

11. Nagasaki K, Hiura M, Kikuchi T, Uchiyama M. A case of hypoglycemia with secondary carnitine deficiency due to long-term use of antibiotics. Shonika-Rinsho. 2005;58:1893-1897.

12. Hanayama R, Okida K, Tsuboi A, Ogura K, Norimatsu T, Sumi S, Miyagawa S. A case of suspected carnitine deficiency after status epilepticus due to antibiotic use. Shonika. 2010;51:1087-1090.

13. Kouda T, Horimukai K, Inoue T, Murakami J, Kobayashi H, Hasegawa Y, et al. A case of carnitine deficiency due to intermittent use of antibiotics. Shonika-Rinsho. 2008;71:1053-1056.

14. Tanikawa M, Honda T, Kaiyama H, Kai Y, Akao S. A case of hypoglycemia caused by cefcapene pivoxil hydrochloride in elderly patient. Igaku-Kensa. 2013;62:290-292.