

AMR can affect newborns! A 5-month-old boy with a urinary tract infection caused by AMR bacteria

Chief complaints: Persistent fever (7 days), irritable

Past medical history: None reported

Case history

7 days before: Fever of 39.0°C

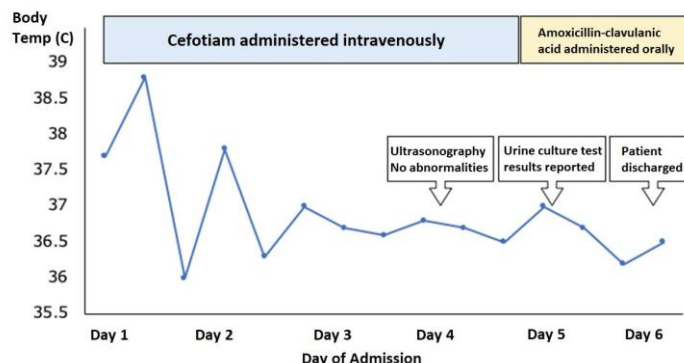
5 days before: His mother took him to a local physician for persistent fever and he was administered an antipyretic for observation.

1 day before: They visited the local physician for his persistent fever once again. A blood test showed increased inflammatory response. He was administered **Cefditoren pivoxil (MEIACT®)**, an oral third-generation cephalosporin antibiotic.

Day of admission: His fever was persistent and he became irritated, so he was referred to our hospital. He was diagnosed with an upper urinary tract infection and admitted.



(Photo is for reference only)



Day 1: Treatment with cefotiam 80 mg / kg / day begins.

Day 5: **ESBL-producing *Escherichia coli*** found in urine culture. Shifted to oral amoxicillin/clavulanic acid.

Day 6: After shift to oral medication, he had no fever and was discharged.

ESBL-producing <i>E.coli</i>	
Ampicillin	R
Ampicillin/sulbactam	S
Cefazolin	R
Cefotiam	R
Cefotaxime	R
Cefmetazole	S
Meropenem	S
ST Combination	R
Fosfomycin	S

S: Susceptible R: Resistant

Temperature 37.7°C, heart rate 140 bpm, respiratory rate 40, and O₂ saturation 98%.

Strong crying, irritable

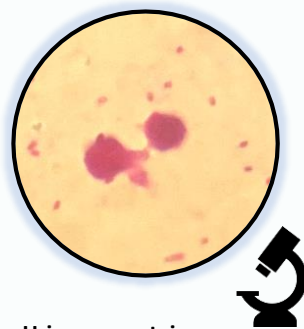
HEENT: Flat anterior fontanel, no redness of pharynx

Pulmonary/chest: Breathing sounds clear on left and right, no murmur

Abdominal: Flat, soft, no pain on pressure

Extremities: No rash, no peripheral coldness

Blood test		Urinalysis (qualitative, sediment)	
WBC	30,000 /μL	Leukocytes	3+
Hb	11.4 g/dL	Nitrite	-
AST	42 U/L	Bacteria	2+
ALT	34 U/L	WBC	50-99 /HPF
Cre	0.27 mg/dL	Ultrasonography	
CRP	6.48 mg/dL	No hydronephrosis or other abnormality of note was observed	



Urine gram stain
Many white blood cells
Many gram negative bacilli

Three points regarding extended spectrum beta-lactamase (ESBL) producing bacteria

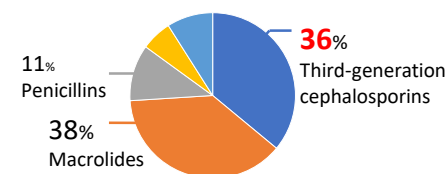
- 1. Resistance**
- 2. Resistance can spread to other bacteria**
- 3. Presence in communities**

- They show resistance to various antimicrobials.
- Their influence leads to increased use of third-generation cephalosporins.

- ESBL-producing bacteria spread resistance genes to other bacteria.

- In addition to hospital-acquired infections, community-acquired infections like this case study are on the rise.

Oral antimicrobials prescribed to children in Japan



- Over one-third of all antimicrobials prescribed are oral third-generation cephalosporins.

Yamasaki D, et al. *Infection*. 2018;46:207-214.

- Many are prescribed to preschool-aged children age five and below, especially one-year-olds.

Kinoshita N, et al. *J Infect Chemother*. 2019;25:22-27.

- They are even prescribed for upper respiratory infections that do not require antimicrobials.

Problems with oral third-generation cephalosporins: The two "lows"

- 1. Low absorption rates (bioavailability)**
Third-generation cephalosporins have absorption rates ranging from 15% to 45%, so they are mostly excreted.
- 2. Low blood sugar**
Some contain pivoxil groups which can cause hypocarnitinemia-induced hypoglycemia.

Tatebe Y, et al. *J Infect Chemother*. 2020;26:86-91.

→ Situations that require oral third-generation cephalosporins are limited.
Let's do our best to prescribe them in a way that will not increase resistant bacteria for the children of the future!

This report has been published with permission from the subject's family. Certain details regarding personal information have been changed to ensure anonymity.

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