

**Title:**

**The first description of the extended-spectrum beta-lactamase blaSHV-12 gene in a Salmonella monophasic Typhimurium strain isolated from acute gastroenteritis in a kidney transplant recipient in Southeast Spain**

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**The first description of the extended-spectrum beta-lactamase *bla*<sub>SHV-12</sub> gene in a *Salmonella* monophasic Typhimurium strain isolated from acute gastroenteritis in a kidney transplant recipient in Southeast Spain**

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*Dear Editor,*

Acute gastroenteritis (AGE) is a common disease within the population (1). Most cases are self-limited. However, intensive treatment is sometimes necessary to ensure patient integrity. This disease is characterized by vomiting and/or diarrhea with blood or mucus, discomfort, fever, and nonspecific abdominal pain. Commonly involved pathogens in the developed world include: viruses, bacteria, and parasites (1,2). In this paper we report a rare cause of AGE.

**Case report**

A 65-year-old kidney transplant recipient (in 1987) suffering from hypertension, hypothyroidism, aortic regurgitation, and benign prostatic hypertrophy, who was on cyclosporine, mycophenolate sodium, prednisone, levothyroxine, doxazosin, and furosemide, presented to the Emergency Room after three days of vomiting and

diarrhea, without fever or abdominal pain. The patient had acute renal failure (creatinine 3.51 mg/dl), thus we decided to initiate empirical antibiotic therapy (ciprofloxacin) and fluid therapy after taking stool samples for culture according to our standard procedure (3). The culture was positive for *Salmonella enterica*, serogroup B1, with production of extended-spectrum beta-lactamase (Table I). After the first few doses of intravenous antibiotic the diarrhea stopped and the patient recovered his renal function (creatinine 1.54 mg/dl), so he was sent home to complete treatment with antibiotics. The isolate was sent to the Spanish reference laboratory for *Enterobacteriaceae*, where it was confirmed and characterized. The presence of genes encoding the beta-lactamases TEM, CTX-M, and SHV were analyzed by PCR and sequencing on both strands (4). The isolate was confirmed as *Salmonella enterica*, subspecies *enterica* (I), serotype 4,5,12:i:- (monophasic Typhimurium), phage type 138, SHV-12 producer.

### Discussion

Renal transplant patients receive immunosuppression for the prevention of graft rejection, which also predisposes patients to more infections and tumors. Infection is the second leading cause of death in kidney transplant recipients in our hospital (1<sup>st</sup>, cardiovascular; 3<sup>rd</sup>, tumors) (5), and often results from pathogens uncommon in the general population, as was the case with this patient.

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**Table I. Antibiotic susceptibility of extended-spectrum beta lactamase-producing *Salmonella* monophasic Typhimurium according to the MicroScan system and E-test**

<i>Antibiotic</i>	<i>MIC (in µg/ml)</i>	<i>Clinical category</i>
Ampicillin	> 16	R
Amoxicillin/clavulanic acid	≤ 8/4	
Piperacillin/tazobactam	≤ 8	
Cefazolin	> 16	R
Cefuroxime	> 16	R
Cefoxitin	≤ 8	
Cefotaxime	32 (> 16)*	R
Cefotaxime/clavulanic acid	≤ 0.5 (0.047)*	
Ceftazidime	32 (> 32)*	R
Ceftazidime /clavulanic acid	≤ 0.25 (0.8)*	
Cefepime	8	I
Imipenem	≤ 1	S
Ertapenem	≤ 0.5	S
Aztreonam	> 16	R
Gentamicin	> 8	R
Tobramycin	> 8	R
Amikacin	≤ 8	S
Nalidixic acid	≤ 16	S
Ciprofloxacin	0.016	S
Levofloxacin	> 4	R
Trimethoprim/sulfamethoxazole	> 2/38	R
Tigecycline	≤ 1	S

\*MIC (minimum inhibitory concentration) by the E-test.