

# Successful Treatment with Verapamil and Oxygen for Hemodialysis-Related Headache in a 15 Year Old Girl

Marina Khvan MD<sup>1,2</sup> and Sandro Vento MD<sup>1</sup>

<sup>1</sup>Department of Medicine, School of Medicine, Nazarbayev University, Astana, Kazakhstan

<sup>2</sup>Renal Center, National Research Center for Maternal and Child Health, University Medical Center, Astana, Kazakhstan

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**A** 15 year old girl followed at the National Research Center for Maternal and Child Health in Astana, Kazakhstan, for end-stage renal disease due to vesicoureteral reflux developed severe bilateral headaches resistant to non-steroidal anti-inflammatory drugs in association with hemodialysis (HD) sessions. The pain was bi-temporal and excruciating (maximal intensity 9/10), occurring 60–90 minutes after the start of each session and stopping gradually 2–3 hours after its completion. The average blood pressure during HD was 113/78 mmHg, and neurological examination was normal.

The history revealed that the girl had developed hypertension after starting hemodialysis 5 years earlier, with severe headache during every session, despite blood pressure control under combined therapy with foscipril 10 mg, amlodipine 20 mg and atenolol 50 mg daily. She had then been transferred to automatic peritoneal dialysis; her hypertension had improved initially but she subsequently again experienced hypertensive crises (190/100 mmHg) with generalized seizures; eprosartan 600 mg daily was then added to the anti-hypertensive regimen.

In the 2 years before she presented to us, antihypertensive therapy had been reduced and eventually discontinued. When the dialysis regimen had been changed back to HD (three 4 hour sessions weekly with bicarbonate-based solution) due to peritonitis, the patient's hypertension had reappeared and she had been gradually and successfully treated with eprosartan 600 mg, foscipril 20 mg and bisoprolol 2.5 mg daily.

Attempts to change the HD regimen by prolonging duration to 6 hours with decreased blood rate flow at 100 ml/min or to use a short 3 hour daily regimen were unsuccessful and the headache persisted. A diagnosis of dialysis-related headache was made as the headache occurred during HD and resolved spontaneously after the session [1]. In addition to hypertension, other causes of HD-related headache such as low urea, sodium or magnesium level, caffeine withdrawal, structural brain changes and depression were also ruled out by appropriate investigations. When therapy with verapamil (160 mg daily initially, then 80 mg per day due to bradycardia) and oxygen (7 liters via nasal cannula during the HD session initially, then 5 liters) was introduced, further headache episodes were successfully prevented.

Six months later the patient received a living donor organ. Her antihypertensive therapy was gradually discontinued and in the following 2 years the girl has not shown any recurrence of headache or hypertension.

Headache is one of the most frequent HD-related neurological symptoms and affects 27 to 70% of patients [2,3]. The pathophysiology is still unclear [4]. Although our patient did not meet the International Headache Society criteria for cluster headaches or migraine, her headache responded to treatment with verapamil and oxygen, which had been used in the only reported case to date of probable cluster headache in a hemodialysis patient [5]. Perhaps hypoxemia that occurs at the beginning of the sessions and functional vasoconstriction play a role in the pathogenesis of HD-related headache and merit further investigation.

## Correspondence

**Dr. S. Vento**

Dept. of Medicine, School of Medicine, Nazarbayev University, Astana 010000, Kazakhstan

**Phone:** (7 7 172) 694654

**email:** sandro.vento@nu.edu.kz

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## “Ethics, decency, and morality are the real soldiers”

Kiran Bedi (born 1949), Indian Police Service officer (now retired), social activist, former tennis player and politician

“I have noticed that when chickens quit quarreling over their food they often find that there is enough for all of them I wonder if it might not be the same with the human race”

Don Marquis (1878-1937), American humorist and poet