Potassium and Magnesium in Breast Milk of a Woman With Gitelman Syndrome

To the Editor: Gitelman syndrome is an autosomal recessive tubulopathy leading to defects in the apical sodium chloride transporter in the distal convoluted tubule.[1] This results in hypokalemia and metabolic alkalosis, often accompanied by hypomagnesemia.[1] In pregnancy, hypokalemia and hypomagnesemia may aggravate because of maternal physiological changes and fetal demands.[2]

We studied if breastfeeding leads to an increased demand of potassium and magnesium postpartum for the mother with Gitelman syndrome and if these levels in the breast milk are adequate for the child. A 28-year-old primigravida known with Gitelman syndrome (mutations: c.1387G>A [p.Gly463Arg] and c.815T>C [p.Leu272Pro]) gave birth to a healthy daughter at 39 + 2 weeks of gestational age. She used oral potassium and magnesium supplementation and amiloride. Peripartum, she was treated with i.v. potassium and magnesium until normal levels were reached. Because she started breastfeeding, amiloride was converted to spironolactone. Table 1 reveals levels of potassium and magnesium in plasma and breast milk using an indirect ion-selective electrode (verified by direct ISE [ABL90 flex, Radiometer, Copenhagen, Denmark]) and colorimetric end point method, respectively, Cobas 8000 analyzer system (Roche Diagnostics, Mannheim, Germany). The baby had normal growth and development.

Potassium and magnesium have crucial roles in, among others, growth and metabolism because they serve as cofactor for many enzymes involved in protein, fatty acid, and glycogen synthesis, glycolysis, and bone formation.[3–5] During lactation, potassium requirement is increased because of secretion of potassium in the breast milk. The mean potassium content of breast milk in healthy women 0 to 4 months postpartum is 12.8 to 15.0 (range 7.9–23.2) mmol/l with higher values in the first week and decreasing quickly thereafter.[S1–S3] We found comparable levels of potassium in the breast milk of our patient on increased oral supplementation. Furthermore, median levels of magnesium in the breast milk of healthy women are 1.27 to 1.40 (range 0.62–2.63) mmol/l and remain fairly stable during the course of lactation.[S2–S4]

Table 1. Levels of potassium and magnesium in plasma and breast milk in a patient with Gitelman syndrome

	Pl-K^+	Milk K^+	Dosage K^+	Pl-Mg^{2+}	Milk Mg^{2+}	Dosage Mg^{2+}
GA						
34 + 2	3.8		150	0.58		1.0
36 + 2	4.3		150	0.62		4.5
37 + 2	4.0		200	0.60		7.5
38 + 2	3.9		200	0.60		15.0
38 + 6	4.4		225	0.65		24.0
Postpartum						
Day 7	3.6	16.1	350	0.65	1.58	15.0
Day 11	3.4		350	0.72		15.0
Day 14	3.2		350	0.69		15.0
Day 18	4.4	15.3	350	0.74	1.53	15.0
Day 21	3.4	14.7	350	0.76	1.06	15.0
Day 28	3.2		350	0.63	0.95	15.0
Day 36	4.1	12.8	350	0.70	1.11	15.0
Day 49	3.9	15.5	300	0.71	1.42	10.0
Day 82	3.4		200	0.71		2.5
Day 123	3.4		200	0.68		0

GA, gestational age; K^+, potassium ion; Mg^{2+}, magnesium ion; Pl, plasma.
Plasma and milk levels are expressed as mmol/l. Dosages of supplementation of potassium chloride and magnesium gluconate in mmol/d.

We found fluctuating levels of magnesium that were within this range in our patient.

Our data suggest adequate potassium and magnesium levels in the breast milk from a mother with Gitelman syndrome on oral supplementation and potassium-sparing diuretics. Only increase in oral supplementation to the mother was necessary.

SUPPLEMENTARY MATERIALS

Supplementary File (PDF)

Supplementary References.

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Margriet F.C. de Jong[1], Ineke J. Riphagen[2], Jenny E. Kootstra-Ros[3] and Mariette Groenewout[4]

[1]Department of Nephrology, University Medical Center Groningen, Groningen, The Netherlands; [2]Department of Clinical Chemistry, Certe Medical Diagnostics & Advise, Medical Center Leeuwarden, Leeuwarden, The Netherlands; [3]Department of Laboratory Medicine, University Medical Center Groningen, Groningen, The Netherlands; and [4]Department of Obstetrics and Gynecology, University Medical Center Groningen, Groningen, The Netherlands

Correspondence: Margriet F.C. de Jong, Division of Nephrology, Department of Internal Medicine, University Medical Center Groningen, Hanzeplein 1, 9713 GZ Groningen, The Netherlands. E-mail: m.f.c.de.jong@umcg.nl

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