Maternal high therapeutic dose of iodide during breastfeeding: results from the UmbrelLACT study – A contribution from the ConcePTION project

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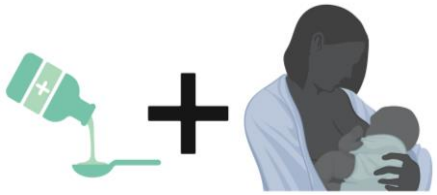
Introduction

High therapeutic doses of iodide during breastfeeding are insufficiently studied with only one study describing the effect during lactation and the risk of hypythyroidism in infants.[1]



One mother using high doses of potassium iodide (KI) over 2 weeks in preparation for a thyroidectomy was included in the UmbrelLACT study.[2] Iodine concentrations in human milk were determined and infant exposure was estimated.

Methods

At 5 months postpartum, **KI (3x50 mg/day) intake occurred** over 2 weeks before surgery. Human milk samples were collected opportunistically before and shortly after surgery and systematically during 5 (24 hour) sampling days (Fig 1).

Iodine concentrations were assessed using inductively coupled plasma tandem mass spectrometry (ICP-MS/MS) to estimate infant exposure. The **general health of the infant,** who restarted breastfeeding after maternal treatment, were reported by the mother as well.

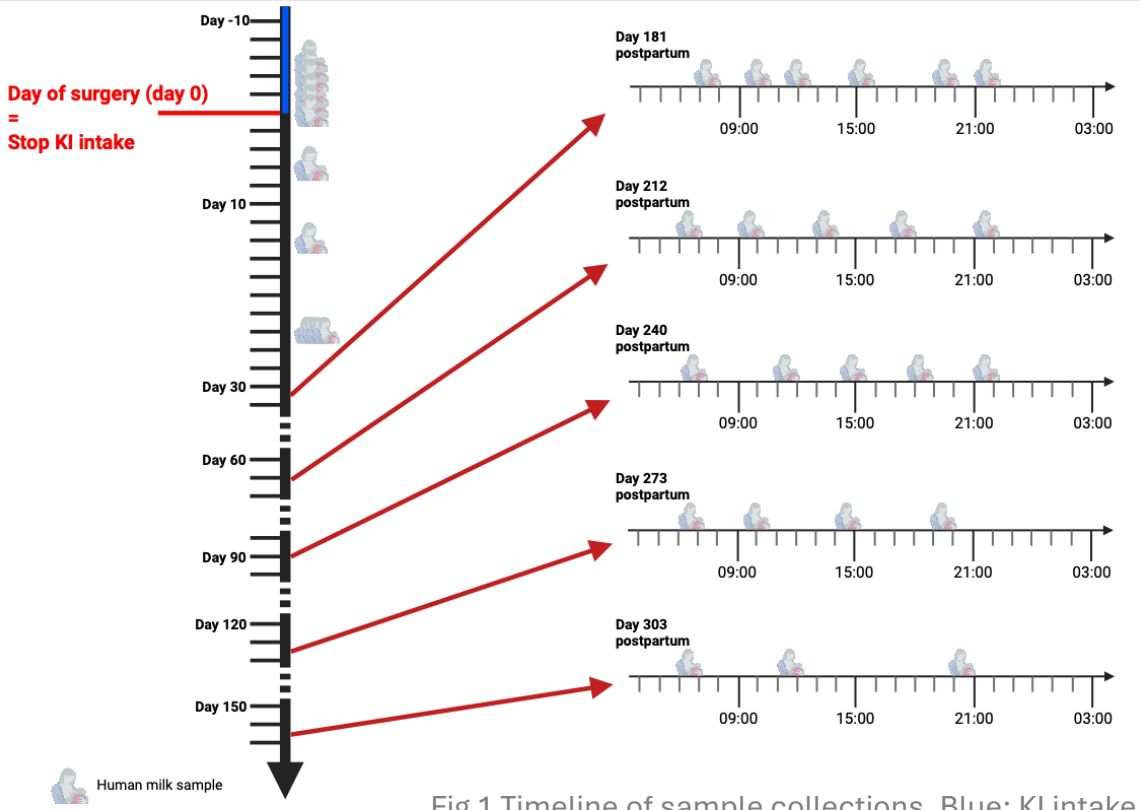


Fig 1 Timeline of sample collections. Blue: KI intake, left: opportunistic samples, right: sampling days.

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Results

The **median (range) concentration of iodine in human milk** during KI treatment was 70 805 (46560 – 80828) ng/mL and 64.3 (15.8-227.0) ng/mL after treatment.

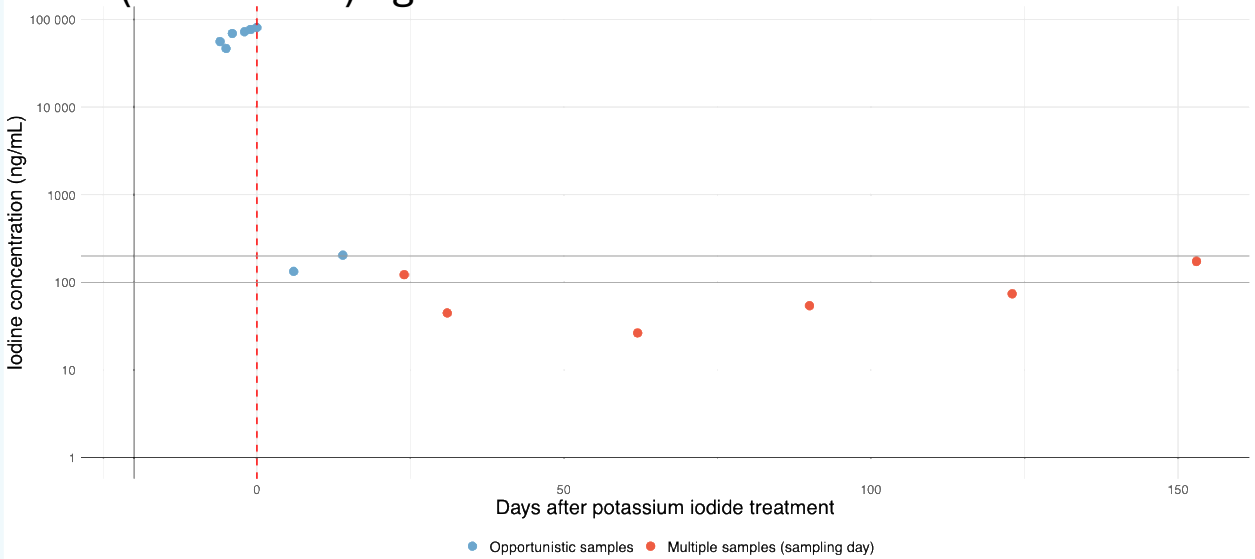

Fig 2 Iodine concentrations in human milk of opportunistic samples (blue) and average concentration of multiple samples per day (red). Grey lines indicate the suggested human milk iodine concentration range of 100-200 ng/mL[3].

An **iodine concentration in human milk of 100 – 200 ng/mL was suggested** to ensure positive iodine balance[3], meaning that milk concentrations during KI intake are significantly higher than recommended human milk concentrations.

The daily infant dosage (DID) was calculated using a human milk intake of 150 mL/kg/day and 200 mL/kg/day for early infancy:

$$DID\ (ng/kg/day) = (average)\ milk\ concentration\ (ng/mL) * human\ milk\ intake\ (mL/kg/day)$$

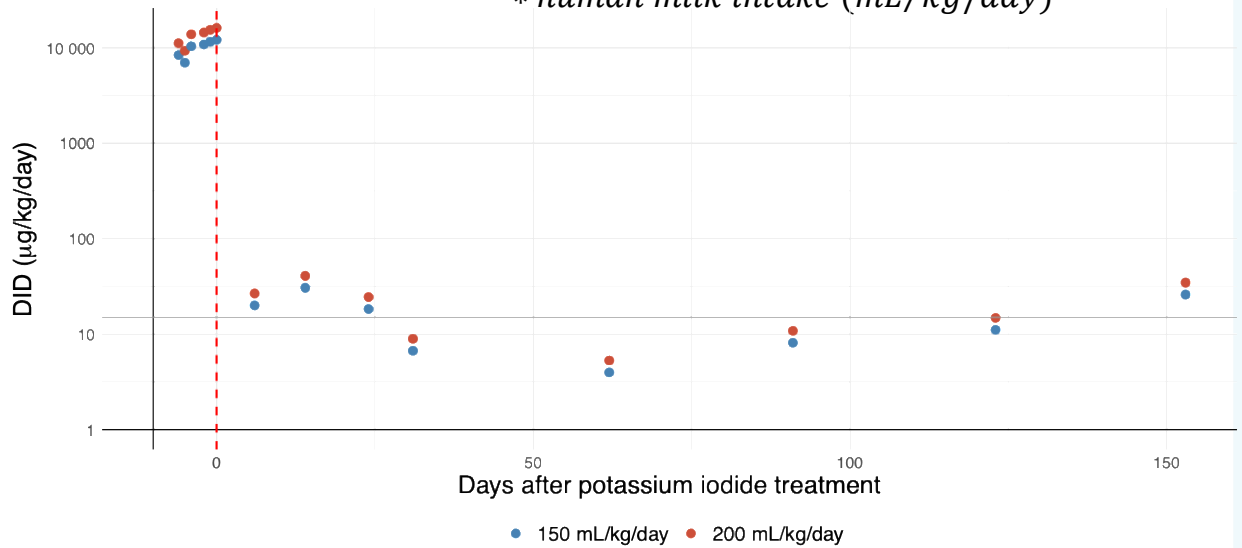

Fig 3 Daily infant dosage (DID) for an intake of 150 mL/kg/day and 200 mL/kg/day. Grey line indicates minimal iodine requirements for term infant (15 µg/kg/day)[4].

Lastly, **no adverse events** on the infant's health were reported by the mother during or up to 7 months after KI treatment, despite being temporarily weaned from breastfeeding during maternal KI intake.

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Conclusion

- ✓ **The human milk iodine concentrations** after discontinuation of maternal KI treatment are **consistently low** (range 16-227 ng/mL) and **similar to the mean human milk iodine concentrations** found in **Nordic countries** (68 to 90 ng/mL).[3]
- ✓ The estimated **infant exposure** after maternal treatment is low and **comparable to the minimal infant requirements** for term infants (15µg/kg/day).[4]
- ✓ **No effects** were reported on the **general health of the breastfed infant,** who restarted (partial) breastfeeding within 1 week after maternal treatment.
- ✓ Therefore, we suggest that breastfeeding should be **discontinued during maternal KI intake** and **could be restarted (exclusively) 3 weeks** after finalisation of maternal treatment.
- ✓ **More research** is required to assess breastfeeding recommendations during and after high doses of KI intake as preparation of a thyroidectomy.

References

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