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Improving Knowledge of Lactation Compatibility of Antirheumatic Medications Among Providers Who Care for Patients With Rheumatic Disease

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Objective. We sought to evaluate and improve knowledge of lactation compatibility of medications commonly used to treat rheumatic diseases among rheumatology, obstetric, and newborn providers practicing at an academic safety net hospital.

Methods. Baseline knowledge of rheumatic disease medication compatibility with lactation among 49 providers was obtained via a multiple-choice questionnaire. Following initial evaluation, providers were given a rheumatic diseases and lactation information card. The questionnaire was readministered at the time of card distribution and 5 months later.

Results. At baseline, more rheumatology providers correctly identified a higher number of lactation-compatible and noncompatible medications than nonrheumatology providers (78% and 65% vs 31% and 46%, respectively; $P < 0.0001$). After the intervention, rheumatology providers correctly identified lactation-compatible and noncompatible medications 98% and 100% of the time, compared with 78% and 65% of the time before the intervention ($P < 0.0001$ and $P < 0.0001$). This improvement was durable because rheumatology providers correctly identified lactation-compatible and noncompatible medications 96% and 98% of the time 5 months following the initial intervention ($P = 0.0021$ and $P < 0.0001$). Nonrheumatology providers correctly identified lactation-compatible and noncompatible medications 31% and 46% of the time before the intervention and 95% and 100% of the time after the intervention ($P < 0.0001$ and $P < 0.0001$).

Conclusion. Rheumatology providers had better baseline knowledge than obstetric and newborn providers of the breastfeeding compatibility of medications used to treat rheumatic diseases. However, all providers had knowledge gaps. After a simple educational intervention, the knowledge gap was significantly narrowed in all provider groups. This improvement was durable because repeat testing of the rheumatology provider subset 5 months post intervention continued to show significant improvement.

INTRODUCTION

The benefits of breastfeeding are numerus and include improved mother-infant bonding, reduced risk of diabetes development in breastfed offspring, accelerated postpartum weight loss, and reduced risk of breast cancer in the mother (1). Moreover, the immune system of a newborn is immature. Breast milk contains large amounts of immunoglobulin A, which mitigates the newborn's immature immune system, improving the newborn's ability to fight infections (2). For these reasons, the American Academy of Pediatrics recommends exclusive breastfeeding for the first 6 months of an infant's life and continued use of breast milk through year one (3).

For women with rheumatic diseases, who require medications for disease control in the postpartum period, resources regarding antirheumatic disease medication compatibility with lactation are limited and can be difficult to interpret. Thus, providers caring for these patients often have significant knowledge gaps regarding rheumatic disease medication safety during lactation and, as a result, may fail to recommend breastfeeding in their patients. Moreover, rheumatology patients themselves may avoid breastfeeding because of concerns regarding medication safety (4). In this quality improvement project, we sought to evaluate and improve knowledge of rheumatology medication compatibility with lactation among rheumatology, obstetric, and newborn providers at an academic safety net hospital. We anticipate that improved knowledge will ultimately lead to better communication with patients with rheumatic diseases regarding risks and benefits of breastfeeding.

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No potential conflicts of interest relevant to this article were reported.

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SIGNIFICANCE & INNOVATIONS

- There are knowledge gaps regarding rheumatic disease medication compatibility with lactation among rheumatology, obstetric, and newborn providers.
- At baseline, rheumatologists had superior knowledge regarding rheumatic disease medication compatibility with lactation compared with obstetric and new born providers.
- Our data suggest that a simple educational intervention can improve these knowledge gaps.

MATERIALS AND METHODS

Health care providers were recruited from the rheumatology clinic, the obstetrics and gynecology clinic, the labor and delivery unit, and the newborn unit at a safety net hospital that serves a diverse patient population and delivers more than 12,000 babies per year. Baseline lactation knowledge among providers was obtained via a 10-question multiple-choice questionnaire (4) (Supplementary Material 1). The questionnaire was given to rheumatology midlevel practitioners, fellows, and attendings; obstetric midlevel providers (nurse-midwives), residents, and attendings; and pediatric midlevel providers and residents. Providers were then given a rheumatic diseases and lactation card (Figure 1) and were asked to take the questionnaire again at the follow-up 5 months later (5) We assessed knowledge change before and after the intervention and analyzed the data via the χ^2 test. Institutional review board exemption was obtained for this quality improvement intervention in January 2019.

RESULTS

The initial pre- and postintervention questionnaires were administered to 49 providers (22 rheumatology and 27 nonrheumatology providers), with a 100% response rate. Rheumatology providers included two midlevel providers, seven fellows, and thirteen attending physicians. Nonrheumatology providers included seven nurse-midwives, nine obstetrics and gynecology residents, three obstetrics and gynecology faculty, six pediatric midlevel providers, and two pediatric residents. Only rheumatology providers

Rheumatic Diseases and Lactation

- Women should be encouraged to breastfeed if desired
- There are no data to suggest that lactation worsens disease activity
- Risks/benefits should be reviewed with each patient for her particular situation

Medical therapy during lactation+

Compatible

- NSAIDs, ASA (81mg)
- Prednisone <20mg
- Hydroxychloroquine
- Sulfasalazine
- Colchicine
- Azathioprine
- Cyclosporine
- Tacrolimus
- TNF inhibitors
  - Infliximab
  - Etanercept
  - Adalimumab
  - Golimumab
  - Certolizumab
- Anakinra*
- Belimumab
- Abatacept*
- Tocilizumab
- Sekukinumab*
- Ustekinumab*
- Rituximab

"Pump & Dump"

- Prednisone > 20mg/day: delay breastfeeding or discard breast milk for the first four hours following steroid administration

Contraindicated

- Methotrexate
- Leflunomide
- Mycophenolate mofetil
- Thalidomide
- ASA (325mg)
- Apremilast **
- Tofacitinib**

+ Patient/provider resources: **MotherToBaby**; **LactMed**

*Medications unlikely to pass into breast milk in significant quantities due to molecule size but have not been studied

**Medications are likely to pass into breast milk due to molecule size but have not been studied

Figure 1. The rheumatic diseases and lactation card was developed to assist providers in determining the compatibility of medications with lactation. ASA, aspirin; NSAID, nonsteroidal anti-inflammatory drug; TNF, tumor necrosis factor.

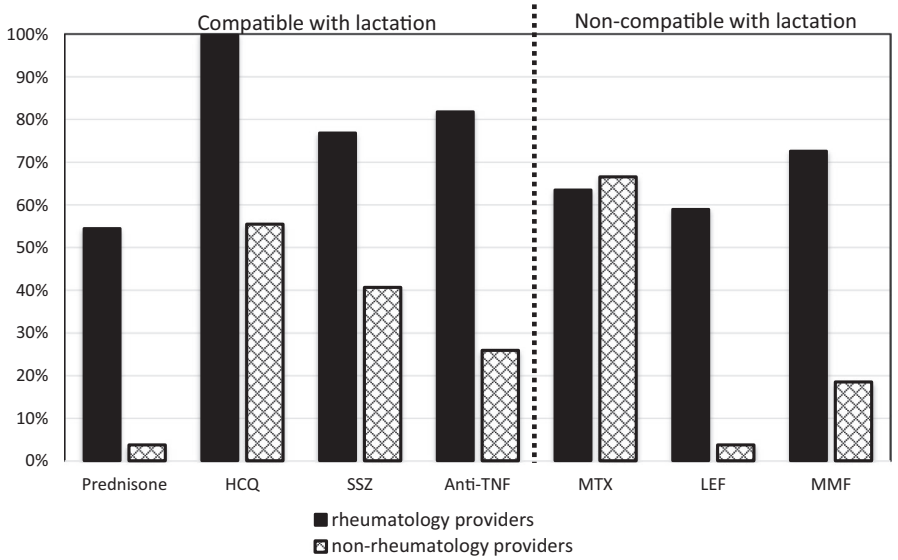

Figure 2. Preintervention knowledge of medication compatibility with lactation among rheumatologist versus nonrheumatologists. Provider knowledge regarding use of prednisone, hydroxychloroquine (HCQ), sulfasalazine (SSZ), tumor necrosis factor α inhibitors (anti-TNF), methotrexate (MTX), leflunomide (LEF), and mycophenolate (MMF) was assessed. At baseline, rheumatology providers correctly identified a higher number of lactation-compatible and noncompatible medications than nonrheumatology providers prior to the intervention (78% and 65% compared with 31% and 46%, respectively; $P < 0.0001$).

were available for the 5-month follow-up questionnaire. The response rate at the 5-month follow-up was 86% and included responses from one midlevel provider, seven fellows, and ten attending physicians.

At baseline, rheumatology providers correctly identified a higher number of lactation-compatible and noncompatible medications than nonrheumatology providers prior to the intervention (78% and 65% compared with 31% and 46%, respectively; $P < 0.0001$) (Figure 2). After the intervention, rheumatology providers correctly identified lactation-compatible and noncompatible medications 98% and 100% of the time compared with 78% and 65% of the time before the intervention ($P < 0.0001$ and $P < 0.0001$) (Figure 3). This improvement was durable because rheumatology providers correctly identified lactation-compatible

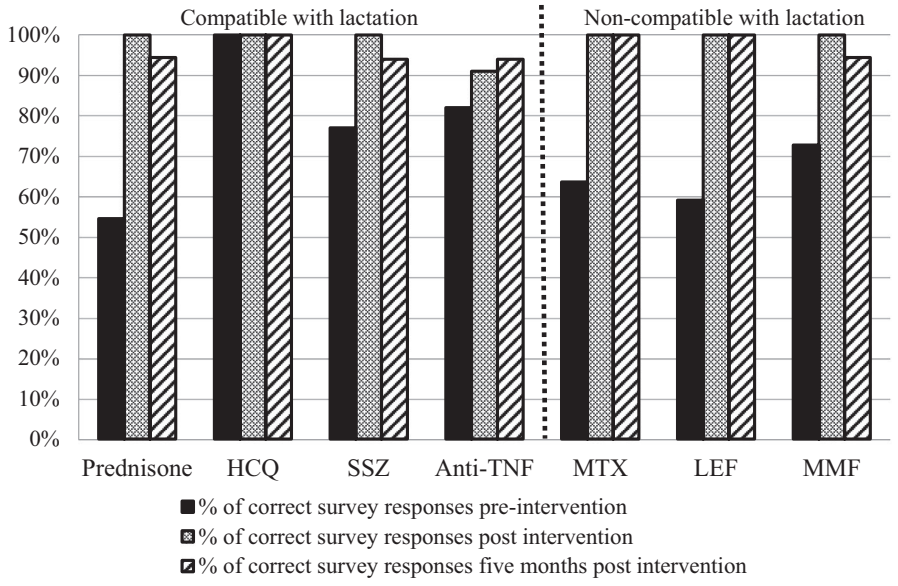

Figure 3. Knowledge of medication compatibility with lactation among rheumatology providers before and after the intervention. Provider knowledge regarding use of prednisone, hydroxychloroquine (HCQ), sulfasalazine (SSZ), tumor necrosis factor α inhibitors (anti-TNF), methotrexate (MTX), leflunomide (LEF), and mycophenolate (MMF) was assessed. After the intervention, rheumatology providers correctly identified lactation-compatible and noncompatible medications 98% and 100% of the time, compared with 78% and 65% before the intervention ($P < 0.0001$ and $P < 0.0001$).

and noncompatible medications 96% and 98% of the time 5 months following the initial intervention ($P = 0.0021$ and $P < 0.0001$). Nonrheumatology providers correctly identified lactation-compatible and noncompatible medications 31% and 46% of the time before the intervention and 95% and 100% of the time after the intervention ($P < 0.0001$ and $P < 0.0001$) (Figure 4).

DISCUSSION

In our study, we showed that at baseline, rheumatology providers had better knowledge of the breastfeeding compatibility of medications used to treat rheumatic diseases than obstetricians and pediatricians. However, both rheumatology and nonrheumatology providers had knowledge gaps. After a simple intervention that included a laminated, pocket-sized information card, the knowledge gap was significantly narrowed. This improvement was durable because repeat testing of the rheumatology provider subset at 5 months continued to show significant knowledge improvement.

Previous studies have shown that lack of confidence in knowledge surrounding reproductive issues, such as contraception and medication teratogenicity, can impact providers' willingness to discuss these issues with their patients (6). Simple educational interventions targeted at rheumatology providers have been shown to improve knowledge gaps (6). Most rheumatology patients receive their information regarding breastfeeding from nonrheumatology sources, with one study showing that only 12% of patients received advice from their rheumatologist. Multiple women in that study did not initiate breastfeeding or stopped breastfeeding prematurely because of concern that a medication they were prescribed was not lactation compatible (4). In the present study, rheumatologists had greater baseline knowledge of medication compatibility with breastfeeding than nonrheumatology providers, underscoring that they may be uniquely primed to help with medication decisions in the postpartum period. A recent study by El Miedany and Palmer (7) advocates for a rheumatology nurse-led pregnancy clinic to enhance the care and ensure appropriate education for rheumatology patients of childbearing potential. Simple educational interventions similar to the lactation card in this study could be used as tools to assist with both nursing and patient education in such clinics (7).

Our study endorses previous findings that a readily accessible educational resource can improve providers' knowledge regarding medication compatibility with lactation. For example, a recent study by Njagu et al (8) showed that an education program called Healthy Outcomes in Pregnancy with Systemic Lupus Erythematosus Through Education of Providers (HOP-STEP), which included an educational handout, successfully improved rheumatologists' knowledge and skills in managing women with rheumatic diseases during family planning and pregnancy. After completing HOP-STEP, more providers successfully identified teratogenic medications (from 80.9% to 92.7%; $P = 0.07$) and fewer providers misidentified pregnancy-compatible medications as teratogenic (from 60% to 9%; $P < 0.0001$) (8). In a study by Bell et al (9), a short online educational video enhanced physicians' confidence in managing rheumatic diseases during the childbearing years. Thus, provider education can be implemented by using straightforward innovations. Arming physicians with more knowledge could encourage physicians to engage in more shared decision-making with their patients.

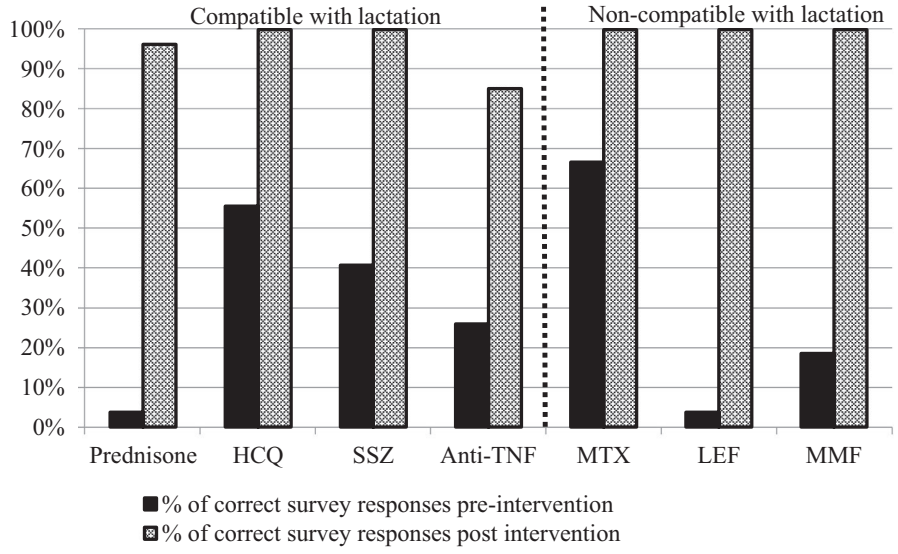

Figure 4. Knowledge of medication compatibility with lactation among nonrheumatology providers (obstetricians and pediatricians) before and after the intervention. Provider knowledge regarding use of prednisone, hydroxychloroquine (HCQ), sulfasalazine (SSZ), tumor necrosis factor α inhibitors (anti-TNF), methotrexate (MTX), leflunomide (LEF), and mycophenolate (MMF) was assessed. Nonrheumatology providers correctly identified lactation-compatible and noncompatible medications 31% and 46% of the time before the intervention and 95% and 100% of the time after the intervention ($P < 0.0001$ and $P < 0.0001$).

Our study has several limitations. Our results are from a single-center experience and may not be generalizable. The rheumatology provider group had more attending physicians than the nonrheumatology group, whereas the nonrheumatology group had more midlevel providers. This could account for the superior baseline knowledge in the rheumatology group. Furthermore, the durability for nonrheumatology providers was not assessed. Our extremely high response rate may reflect providers who, at baseline, have a high knowledge and comfort level with this topic and are therefore self-selected. Although the results were durable for rheumatology providers 5 months post intervention, the response rate fell by 14%. Those rheumatologists who chose to respond to the follow-up questionnaire may have been a biased subgroup of rheumatologists who, at baseline, were more comfortable in their knowledge than those who did not respond. Nonetheless, the extremely high durability suggests that simple educational interventions for providers may have long-lasting impact.

There are knowledge gaps regarding rheumatic disease medication compatibility with lactation among providers. Our data suggest that a simple educational intervention in the form of a laminated card can improve knowledge. Such tools could be especially beneficial in nurse-led multidisciplinary clinics. However, further studies are needed to assess whether improved knowledge translates into better communication with patients regarding medication safety during lactation and ultimately impacts clinical decision-making and patient care.

AUTHOR CONTRIBUTIONS

Drs. Mills and Bermas drafted the article, revised it critically for important intellectual content, approved the final version to be published, and take responsibility for the integrity of the data and the accuracy of the data analysis.

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