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**Authors:** Katarzyna M. Wszolek, Adrianna Nowek, Angelika Odor, Malgorzata Piet, Maciej Wilczak

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## REVIEW PAPER / OBSTETRICS

### Rusty pipe syndrome. Safety of breastfeeding

Katarzyna M. Wszolek<sup>1</sup>, Adrianna Nowek<sup>2,3</sup>, Angelika Odor<sup>2</sup>, Malgorzata Piet<sup>1,3</sup>, Maciej Wilczak<sup>1,3</sup>

<sup>1</sup>*Department of Maternal and Child Health, Poznan University of Medical Sciences, Poland*

<sup>2</sup>*Students Scientific Association, Poznan University of Medical Sciences, Poland*

<sup>3</sup>*Gynaecology-Obstetrics Hospital, Poznan University of Medical Sciences, Poland*

#### Corresponding author:

Katarzyna M. Wszolek

Department of Maternal and Child Health, Poznan University of Medical Sciences, Poland

e-mail: polozna.kasia.wszolek@gmail.com

#### ABSTRACT

The rusty pipe syndrome is an uncommon condition. It is characterised by suddenly painless, bilateral bloody nipple discharge with no visible evidence of mechanical injuries within the breasts. It resolves spontaneously with no additional medical intervention. If the problem persists for more than 5–7 days, further investigations should be made to exclude other pathologies. In the available literature, there is no clear explanation of the condition. Many authors agree that the condition may be caused by the structure of blood vessels and may depend on changes therein that occur during stage I and II lactogenesis. In most cases, it is recognised during breast milk expression, when the colour of milk is different than normally.

**Key words:** rusty pipe syndrome; anxiety; breastfeeding safety; nourishment tolerance

## INTRODUCTION

The *rusty pipe syndrome* is an uncommon condition when the prepartum milk or colostrum are blood-tinged [1–3]. It is estimated that it relates to 0.1% of breastfeeding women, more often among primiparous [3]. Bleeding can occur already in the second or third trimester of pregnancy; however, it is mostly observed when the colostrum is intensively produced [2]. Bloody nipples discharge that occurs with no regard to the hormonal status of the woman causes increased attention and induce observation. Moreover, a reasonable question arises concerning the safety of feeding the newborn child with this milk. Also, mothers may become more anxious [3, 4].

The *rusty pipe syndrome* is characterised by asymptomatic, painless and mostly bilateral bloody discharge during lactation or at the end of pregnancy [3]. It is not accompanied by visible injuries of the nipples. Breaks, positional stripes or crusts that may indicate mechanical injuries caused by sucking the breast or nipple injuries caused by a breast pump. The previous mentioned injuries are the grounds for exclusion of the condition [1, 3]. The colostrum can be stained in different colours, depending on the erythrocyte's concentration: bright red, pink, black or brown [4]. In the available literature, it is stated that the condition appears in the second or third trimester, although can also appear even two months after labour [5,6]. In most of publications, there are recommendations for further diagnostics, if the problem does not self-limit within 5–7 days, or maximally in 10 days from labour [4, 7].

During pregnancy, and especially in the third trimester, nipple discharge with no visible pathology is a common condition [3]. However, even the single occurrence of blood-stained discharge is an indication for further diagnostics and exclusion of pathological conditions, such as *intraductal papilloma of the breast* which is the benign breast proliferative lesion. However, in contrast to the *rusty pipe syndrome* usually characterised by bleeding from both nipples, from many ducts simultaneously or from the enlarged breast [6], bleeding in the proliferative lesion affects only one duct [1–5, 7].

The fragility of walls in the thin blood vessels network located in the breast intersitium is the possible cause of the presence of erythrocytes in the prepartum milk and colostrum. These vessels can break during the proliferation and branching process of lactiferous ducts (stage I lactogenesis) [4, 5, 8]. Some authors suggest as a possible cause the general tendency for bleeding from the nose and gums during pregnancy [3]. Even Hoffman's stretching

exercises recommended for women with flat or concave nipples to make their areolas and nipples more flexible and to facilitate the proper latch [7].

It is worth mentioning that the appearance of blood in the breast milk may be conditioned by immature lactocytes. Transition from the first to the second stage of lactogenesis starts no earlier than 2–3 days after labour. In that time, maturing mammary glands produce more milk, whereas its composition is changing. The intercellular fissures between individual lactocytes get narrower impeding direct blood flow to the lumen of lactiferous alveoli [9].

## **DESCRIPTION OF THE CURRENT STATE OF KNOWLEDGE**

When the patient reports in the second or third trimester that her prepartum milk is stained with blood or when this problem is noticed in the first few days after labour, while there are no other symptoms at the same time, it is good practice after palpation examination of both breasts. Also, taking medical history related to the breast diseases to obtain a cytologic smear and to take a “wait and see” attitude until the description of the sample is received [2, 6]. Cytological examination of the nipple discharge smear as a noninvasively, relatively cheap and accurate procedure, seems to give an explicit answer regarding the further procedure in case of the prepartum milk or colostrum. Lack of atypical cells in the smear allows to exclude a disease process in progress. Moreover, if other features are typical for the condition described by us and many other authors, the *rusty pipe syndrome* can be determined with enough certainty. At the same time, it should be remembered that identification of this condition does not mean that further breasts observation can be discontinued, because the neoplastic lesions of a malignant nature can also develop during pregnancy and lactation. Ultrasound examination before the increased milk production can help to exclude doubtful or pathological lesions [8]. When attempting to identify the *rusty pipe syndrome*, it is necessary to exclude infections of all types within the mammary glands and structural changes of the breast anatomy that can have a direct impact on bloody discharge [10]. In reasonable situations, the diagnostics should be extended with galactography [2, 8].

The patients usually observe abnormal staining of the milk when they use a milk pump to express the colostrum (as an early stimulation of lactation or in case of problematic breastfeeding) or when the newborn child suffers brown or black reflux [1–5, 7, 10, 11]. After the slight breast compression, colostrum tinged with a little or a lot of blood appears outside. Similar situation applies to the second breast.

Discovering the blood-stained maternal milk by mother or medical personnel is usually accompanied by surprise and anxiety both in patients and caregivers [12]. The reasonable question arises concerning the safety of feeding the newborn child with this kind of milk, especially in case of premature babies. Hasty judgement given at this stage of lactation often results in the sudden breastfeeding cessation.

The last prospective observational-cohort study to estimate the prevalence of the *rusty pipe syndrome* was conducted in 1990 [3]. The prevalence of visible blood in 0.1% of breastfeeding women was studied. According to studies conducted in 1964 and 1990, the latent blood was found in as much as 20% of pregnant women reporting any breast discharge and in 15% of mothers at the early stage of lactation. [6, 13]. Other reports on the condition originate from case studies that have been published over the years. Thus, it seems reasonable to conduct a prospective observational study to estimate the occurrence of the condition and to popularize knowledge related thereto. It is also important to distinguish between *rusty pipe syndrome* (discharge of blood-stained milk directly from the milk ducts) and colonisation of milk by *Serratia marcescens* strains that results in change of expressed breastmilk colour in brightly pink [14, 15]. Bloody breast discharge usually piques the interest of gynaecologists and paediatricians. It is important to make the medical personnel and people who take care of women in the post partum period aware of the possible occurrence of the *rusty pipe syndrome* during lactation [4, 10, 19]. Improper reactions or making comments next to the patient may create for her an additional stress and induce breastfeeding cessation.

It was emphasised in many articles that the breastfeeding should be continued, if the new-born child tolerates the maternal milk that contains erythrocytes. Temporary cessation of feeding with breast milk may be considered if the newborn child has a food intolerance, which causes symptoms such as bloating, diarrhoea or constipation and vomiting [1–3, 5, 9, 11, 19]. Temporary breastfeeding cessation may also be recommended when giving colostrum to a premature baby, because black reflex or gastric retention are a reasonable cause of considering an active gastrointestinal bleeding [20]. In this situation, the mother should be suggested to express the milk until it is not stained with blood. Whenever possible, it is suggested to use the milk from a breast milk bank in this period [9].

Effective lactation counselling that is based on the knowledge and experience of the personnel, as well as on trust, acceptance and listening skills should calm down the mother and strengthen the bond between the mother and child during breastfeeding [10, 16, 18–20].

## CONCLUSION

Mothers and newborn children should be covered with interdisciplinary care. It is worth noting that the breastfeeding experience should be both fully comfortable for mothers and safe for newborns. As there are no recommendations to stop breastfeeding if the breastmilk is stained with blood, with exception of temporal food intolerance in child, it is suggested to reassure the mother and explain the possible cause of the condition. Because specialized medical personnel play an invaluable role in this regard, it is very important to train gynaecologists, midwives and paediatrics about the *rusty pipe syndrome*. Knowledge in this topic can help to avoid unnecessary stress for mothers and premature decision on breastfeeding cessation.

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### ***Availability of data and materials***

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### ***Ethics approval and consent to participate***

N/A

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