What is the state of knowledge on preterm birth?

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Summary

Objective: Preterm delivery (PTD) is the leading cause of neonatal mortality and the most common reason for antenatal hospitalization. This study aimed at the assessment of the state of knowledge of women of childbearing age regarding PTD, including its risk factors and symptoms, as well as the procedure performed, and the factors influencing the level of knowledge of women about PTD. Materials and Methods: The study was carried out in the period between July 5-15, 2017 and a group of 93 women of childbearing age residing within the Wielkopolska area, attending obstetric and gynecological clinics. The survey questionnaire was constructed for the purpose of the study and contained questions on the issues related to PTD, including the risk factors and symptoms of PTD, a procedure performed for PTD, and complications faced by the neonate. Results: The sources of knowledge most frequently indicated by the surveyed women were family/friends (26.9%), magazines (28%), and physician (22.5%), while midwives (14%) and birthing school (8.6%) were indicated least frequently. A higher level of knowledge was found among the women who obtained information on PTD from a midwife, physician, and family/friends ($\chi^2 = 22.618; p = 0.004$). Conclusions: A higher level of knowledge on PTD was exhibited by women who obtained information on this issue from a midwife, physician, or family/friends. Therefore, there is a need to educate pregnant woman regarding the risk factors of PTD.

Key words: Preterm delivery (PTD); Knowledge; Midwife; Physician.

Introduction

Preterm birth is the leading cause of neonatal mortality and the most common reason for antenatal hospitalization [1]. Preterm delivery (PTD) refers to the delivery of a baby between 22 and 37 weeks of pregnancy. This condition is caused by an imbalance in the factors related to the pregnant woman, the fetus, and the external environment [2]. The prognosis of survival of a premature neonate depends not only on the stage of pregnancy, but also on the maturity of the fetus, its birth weight, and the changes associated with pregnancy. Termination of pregnancy before full term occurs in an average of 6–15% of pregnant women, depending on the geographic, ethnic, environmental, and population factors. Preventing PTD remains one of the great challenges of modern medicine. Nowadays, the prevalence of preterm births is showing an upward trend. In Poland, the prevalence of preterm births is approximately 7% [3], while in the United States, approximately 12% of all live births occur before term, of which nearly 50% are preterm births. Although the causes of preterm labor are not well understood, the burden associated with preterm births is well known; preterm births account for approximately 70% of neonatal deaths and 36% of infant deaths, as well as 25–50% of cases of long-term neurologic impairment in children [1]. The etiology of PTD is unclear, but it is likely to be complex and influenced by genetic and environmental factors [4]. Preterm births occur frequently due to the following reasons: increased number of obstetric interventions in complicated pregnancies, a higher incidence of multiple pregnancies, thanks to the use of assisted reproductive methods, and the unfavorable impact of environmental pollution in industrialized areas. Women with a history of PTD are at an increased risk of subsequent PTD and are therefore candidates for treatment with antenatal progesterone. Endovaginal ultrasonography for examining cervical length is useful for triage [4]. Identification of symptoms of PTD is highly significant. This is because preventive measures, such as tocolysis, can be applied within the appropriate time to help in delivery retardation to such an extent that drugs for fetal lung maturation can be administered prior to the birth. At the same time, the mother can be transported to a specialized obstetric division with suitable neonatal equipment. It is also highly important to obtain information on the symptoms from the mother, as the risk of PTD in a woman experiencing labor pains within the period of seven days is considerably higher in the presence of bleeding and closed cervix than in the absence of bleeding and a 2-cm dilation [5].

This study aimed at the assessment of the state of knowledge of women of childbearing age regarding PTD, including its risk factors and symptoms, as well as the procedure performed, and the factors influencing the level of knowledge of women about PTD.

Materials and Methods

The study was carried out in the period between July 5-15, 2017 and a group of 93 women of childbearing age residing within the Wielkopolska area, attending obstetric and gynecological clinics. The survey questionnaire used in the study is available online.
The survey questionnaire was constructed for the purpose of the study and contained questions on the issues related to PTD including the risk factors and symptoms of PTD, a procedure performed for PTD, and complications faced by the neonate. The questionnaire also included questions concerning the examined individuals and a question on the source of knowledge of PTD used by the women. The data collected using the questionnaire enabled the determination of the level of knowledge of the surveyed women about PTD. Each correct answer corresponded to 1 point on the knowledge level scale (the maximum number of points that could be scored was 41). For the purpose of the study, the data were interpreted as follows: low knowledge level, 0–20 points; moderate knowledge level, 21–32 points; and high knowledge level, > 32 points. The obtained empirical data were subjected to statistical analysis using the SPSS 11.5 software. In the case of questions on the knowledge of risk factors and symptoms of PTD, the procedure is performed for women at the risk of PTD, and prophylactic activities to minimize the risk of PTD, the value of arithmetic mean was calculated for the indicated correct answers. In order to determine the level of familiarity with individual aspects, the obtained result was subject to transformation, according to the following formula:

$$\text{Knowledge level} = \frac{\text{the average result of correct answers}}{\text{maximum number of correct answers}} \times 100$$

The established research hypotheses were verified using χ² (chisquare) test at a significance level of p < 0.05. Data derived from the verifications of the hypotheses are additionally presented in the form of tables, which, apart from the obtained counts (n) and percentage distribution (%), provide the inference result (χ²) and indicate whether the observed relationship was statistically significant or not.

**Results**

The average age of the respondents was 24.09 ± 4.93 (Me = 24 years, min. 18 years, max. 38 years). For 54.8% of the respondents (n = 51), it was the first pregnancy, while 45.2% (n = 42) already had experienced pregnancy and labor (Table 1). Among the respondents, 88.2% (n = 82) reported that they did not use any stimulants when planning for pregnancy, while 6.5% (n = 6) reported use of stimulants in the form of cigarettes, 4.3% (n = 4) reported intake of a significant amount of caffeine, and 1.1% (n = 1) reported use of alcohol. None of the surveyed women took drugs prior to pregnancy. The characteristics of the study group are presented in Table 1.

According to half of the respondents, PTD is the completion of pregnancy between 22 and 37 weeks of gestation (n = 48; 51.6%). Of these, 19.3% (n = 18) believed that PTD refers to delivery before 35 weeks of pregnancy and 14.0% (n = 13) stated that PTD refers to delivery within 37 weeks of pregnancy. Of the surveyed individuals, 15.1% (n = 14) were unable to indicate what type of delivery is considered as PTD. The knowledge of the surveyed women on medical, social, environmental, and psychogenic risk factors of PTD is presented in Table 2. According to the majority of the surveyed women, PTD symptoms included contracting function (n = 72; 77.4%), premature amniotic sac rupture (n = 62; 66.7%), the pressure in the abdomen (n = 50; 53.8%), and sensation of pressure in the pelvis (n = 49; 52.7%). In addition, 34.4% (n = 32) indicated pain in the sacral region and food cravings (n = 30; 32.3%) as PTD symptoms, while a lesser number of respondents indicated dreams of the upcoming birth (n = 17; 18.3%) and diarrhea and frequent urination (n = 6; 6.5%). The knowledge of the surveyed women on the symptoms, a procedure performed, and the prevention of PTD is presented in Table 3.

The arithmetic mean of correct answers for medical risk factors of PTD was 3.68 ± 1.65 (Me = 4.00, min. 0, max. 7). For social risk factors of PTD, the mean of correct answers was 2.60 ± 1.82 (Me = 3.00, min. 0, max. 6). The mean value of correct answers for the knowledge of environmental risk factors of PTD was 1.99 ± 1.21 (Me = 2.00, min. 0, max. 4). In the case of psychogenic risk factors of PTD, the mean of correct answers was 2.35 ± 1.18 (Me = 2.00, min. 0, max. 4). The mean of correct answers for the knowledge of PTD symptoms was 2.85 ± 1.19 (Me = 2.00, min. 0, max. 5). The mean of correct answers for the knowledge of procedure performed in the event of PTD was 2.14 ± 0.83 (Me = 2.00, min. 0, max. 3). In the case of the knowledge of preventive actions, the mean of correct answers was 2.95 ± 1.14 (Me = 3.00, min. 0, max. 3).
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Table 2. — Knowledge of medical, social, environmental, and psychogenic risk factors of preterm delivery (PTD).

| Knowledge of medical PTD risk factors | N   | %    |
|---------------------------------------|-----|------|
| Pathologies associated with the placenta | 70  | 75.3 |
| Multiple pregnancy                     | 69  | 74.2 |
| Eventful perinatal history (PTD in the previous pregnancy) | 60  | 64.5 |
| Cervical incompetence                  | 54  | 58.1 |
| Preexisting abortions                  | 54  | 58.1 |
| Diabetes                               | 41  | 44.1 |
| Hypertension                           | 34  | 36.6 |
| High vitamin intake during pregnancy   | 16  | 17.2 |
| Polyhydramnios                         | 15  | 16.1 |
| Event of a minor upper respiratory tract disease | 1   | 1.1  |

| Knowledge of social PTD risk factors   | N   | %    |
|----------------------------------------|-----|------|
| Low education level                    | 58  | 62.4 |
| Low social and economic status         | 46  | 49.5 |
| Obesity                                | 45  | 48.4 |
| Malnutrition                           | 43  | 46.2 |
| Use of stimulants                      | 30  | 32.3 |
| Multiparity                            | 20  | 21.5 |
| Heavy manual labor                     | 20  | 21.5 |
| Mother age (< 18 or > 35 years)        | 4   | 4.3  |
| Marital status single                  | 4   | 4.3  |

| Knowledge of environmental PTD risk factors | N | %    |
|--------------------------------------------|---|------|
| Ionizing radiation                         | 50 | 62.4 |
| Radioactive radiation                      | 53 | 57   |
| Thermal radiation                          | 50 | 53.8 |
| Long walks                                 | 41 | 44.1 |
| Vibrations                                 | 39 | 41.9 |
| Environmental pollution                    | 24 | 25.8 |
| Frequent computer use                      | 18 | 19.4 |
| Noise                                      | 18 | 19.4 |

| Knowledge of psychogenic PTD risk factors  | N   | %    |
|--------------------------------------------|-----|------|
| Death in family                            | 64  | 68.8 |
| Own or family diseases                      | 54  | 58.1 |
| Stress associated with insufficient care of the pregnant woman | 52  | 55.9 |
| Conflict situations                        | 47  | 50.5 |
| Obsessions (e.g. for clean hands)          | 28  | 30.1 |
| Anxiety associated with potential fetal loss | 28 | 30.1 |

Total of the obtained answers exceeds 100% because the surveyed women were allowed to select more than one answer.

Comparison of the results obtained for the level of knowledge on individual aspects of PTD allowed determining whether the surveyed women exhibited acceptable knowledge regarding the procedure performed in the event of PTD (71.33). Slightly poor results were recorded for the knowledge of preventive actions against PTD (59.00), knowledge of psychogenic risk factors (58.75), and symptoms of PTD (57.00). The results indicated very poor knowledge level of the surveyed women regarding medical (52.57), environmental (49.75), and social risk factors (43.33) of PTD. The results of the descriptive statistics are provided in Table 4.

The responses of the surveyed women to questions concerning issues related to PTD indicated their level of general knowledge on PTD. It was found that over a half of the respondents exhibited a moderate level of knowledge (n = 65; 69.9%), while 26.9% (n = 25) of the surveyed individuals exhibited a low level of knowledge and 3.2% (n = 3) exhibited a high level of knowledge.

Based on the data obtained on the knowledge level of women with respect to their age and statistical inference of the results at a significance level of \( p < 0.05 \), it was identified that the age of the surveyed women did not constitute a significant factor influencing the level of general knowledge on PTD (\( \chi^2 = 1.549; \ p = 0.809 \)). In addition, the area of residence of the surveyed women did not have a significant influence on their level of knowledge (\( \chi^2 = 3.615; \ p = 0.719 \)). Moreover, education did not have a significant impact on the level of general knowledge on PTD held by the surveyed women (\( \chi^2 = 3.292; \ p = 0.771 \)). No significant differences were found in the general knowledge on
Table 3. — Knowledge on the symptoms, procedure performed, and prophylactic activities against preterm delivery (PTD).

| Knowledge on PTD symptoms | N   | %   |
|----------------------------|-----|-----|
| Contracting function       | 72  | 77.4|
| Premature amniotics sac rupture | 62  | 66.7|
| Pressure in the abdomen    | 50  | 53.8|
| Sensation of pressure in the pelvis | 49  | 52.7|
| Pain in the sacral area    | 32  | 34.4|
| Food cravings              | 30  | 32.3|
| Dreams of the upcoming birth | 17  | 18.3|
| Diarrhea or frequent urination | 6   | 6.5 |

| Knowledge on procedure performed in the event of PTD risk | N   | %   |
|----------------------------------------------------------|-----|-----|
| Performance of control Ultrasound and CTG                | 77  | 82.8|
| Tocolysis, administration of drugs inhibiting contracting function | 64  | 68.8|
| Need for hospitalization                                 | 58  | 62.4|
| Acupuncture                                              | 24  | 47.3|
| Massage session for muscle relaxation                    | 22  | 23.7|
| Listening to symphonic music                             | 11  | 11.8|

| Knowledge on prophylactic activities against PTD         | N   | %   |
|----------------------------------------------------------|-----|-----|
| Elimination of stress situations                         | 71  | 76.3|
| Regular visits for examinations                         | 68  | 73.1|
| Smoking cessation                                        | 56  | 60.2|
| Care for personal hygiene                                | 51  | 54.8|
| Abdomen massage                                          | 31  | 33.3|
| Restriction of physical effort                           | 30  | 32.3|
| Observing the recommendations of the midwife and the nurse | 28  | 30.1|
| Drinking raspberry infusion                               | 10  | 10.8|

Total of the obtained answers exceeds 100% because the surveyed women were allowed to select more than one answer.

Table 4. — Comparison of results of the knowledge of risk factors, symptoms, and procedure performed in the event of preterm delivery (PTD).

|                          | Mean | Standard deviation | Median | Minimum result | Maximum result | Level of knowledge |
|--------------------------|------|--------------------|--------|----------------|----------------|--------------------|
| Medical risk factors     | 3.68 | 1.65               | 4      | 0              | 7              | 52.57              |
| Social risk factors      | 2.6  | 1.82               | 3      | 0              | 6              | 43.33              |
| Environmental risk factors | 1.99 | 1.21               | 2      | 0              | 4              | 49.75              |
| Psychogenic risk factors | 2.35 | 1.18               | 2      | 0              | 4              | 58.75              |
| PTD symptoms             | 2.85 | 1.19               | 2      | 0              | 5              | 57                 |
| Procedure performed in the event of PTD                  | 2.14 | 0.83               | 2      | 0              | 3              | 71.33              |
| Preventive actions against PTD                            | 2.95 | 1.14               | 3      | 0              | 5              | 59                 |

Table 5. — Knowledge of the definition of birth and the general knowledge level.

| Knows the definition of PTD | N    | %   | Does not know the definition of PTD | N    | %   |
|-----------------------------|------|-----|------------------------------------|------|-----|
| Low knowledge level         | 6    | 12.5| Moderate knowledge level            | 40   | 83.3|
| Moderate knowledge level    | 40   | 83.3| High knowledge level                | 2    | 4.2 |
| High knowledge level        | 2    | 4.2 | Total                              | 48   | 100 |
| Total                       | 48   | 100 |                                    | 45   | 100 |

*Statistically significant, $\chi^2 = 10.469; p < 0.05 (p = 0.005).*

PTD between professionally active and studying women [$\chi^2 = 2.478; p > 0.05 (p = 0.290)]]. The general knowledge on PTD was not found to have a significant association in women who had previously given birth ($\chi^2 = 0.607; p = 0.738$).

The surveyed respondents with a low level of knowledge on PTD constituted 42.2% (n = 19) of those who were unable to indicate the period of pregnancy considered as
PTD is still the primary cause of mortality and morbidity in infants, and a serious condition affecting a significant number of pregnant women all over the world. According to the guidelines of the World Health Organization (WHO), PTD is defined as premature completion of pregnancy in the period between 22 and 37 weeks of its duration. PTD may have serious consequences for both the mother and the newborn. Infants born prior to 36 weeks of pregnancy are at a 30-fold higher risk of mortality compared to full-term babies, while for those born prior to 28 weeks the risk of mortality is 200-fold higher [6]. Depending on the degree of prematurity, a series of disorders occur, which limit the capabilities of the child to survive without the assistance of modern medicine. Unfortunately, due to the fast pace of life and an increase in the number of late pregnancies, the prevalence of PTDs is increasing. There is a fine line between born too soon and die too soon; this line increases stress, fear, and distance impacting negatively on communication between mothers and healthcare professionals during antenatal care, childbirth, and neonatal intensive care unit [7]. The present survey aimed at obtaining the answer to the question of whether social and demographic factors, education, and obstetric history have an impact on the knowledge level of the respondents. The results showed that age, the area of residence, education level, or professional activity of the surveyed women did not have a significant impact on their general knowledge level about PTD. Previous birth also did not influence their level of general knowledge on PTD. Dolatian et al. [8] reported that the prevalence of PTD was 7.7%, and demonstrated that socioeconomic factors were not associated with preterm labor. Among the intermediary factors, poor social health, food insecurity, stress, and inadequate prenatal care showed a significant relationship with preterm labor. The prevalence rates of PTD in cases with food insecurity, stress, and inadequate prenatal care were respectively 2, 9.1, and 13.2 times higher than those who had food security, did not experience stress, and received adequate care during pregnancy [8]. Moreover, Dolatian et al.’s review described the prevalence and psycho- and sociodemographic, as well as obstetrical risk factors related to live PTD in the recent decade in Iran. The most common structural determinant was an educational level of mother, intermediary determinants were a psychosocial factor (maternal anxiety and stress during pregnancy), behavioral factor, and maternal circumstance (violence and trauma), and health determinant was lack of prenatal care [9].

In the present study, women of childbearing age exhibited moderate knowledge of PTD. Thus, there exists a necessity to educate women to reduce the risk of this pregnancy complication. Education should primarily focus on the impact of medical, social, and environmental factors on the risk of PTD, as the present study demonstrated the lowest level of knowledge on these factors among the surveyed

| Source of information | Low knowledge level | Moderate knowledge level | High knowledge level | Total |
|-----------------------|---------------------|-------------------------|---------------------|-------|
| Physician             | 4                   | 17                      | 0                   | 21    |
| Midwife               | 19%                 | 81%                     | 0%                  | 100%  |
| Magazines             | 3                   | 7                       | 3                   | 13    |
| Birthing school       |                     | 10                      |                     | 100%  |
| Family/friends        |                     | 37.5%                   | 20%                 | 67.5% |

*Statistically significant, $\chi^2 = 22.618; p < 0.05 (p = 0.004).
women. The sources of knowledge most frequently indicated by the surveyed women were family/friends (26.9%), magazines (28%), and physicians (22.5%), while midwives (14%) and birthing school (8.6%) were indicated least frequently. Based on the analysis of the level of knowledge of women with respect to their source of information on PTD, it was identified that the knowledge level of the surveyed women regarding PTD was associated with the source of information. A higher level of knowledge was found among the women who obtained information on PTD from a midwife, physician, and family/friends ($\chi^2 = 22.618; p = 0.004$). Thus, it is the responsibility of physicians and midwives to educate the pregnant women on risk factors of PTD. In addition, clinicians and researchers play a key role in improving knowledge on PTD, identifying risk factors, and shaping interventions that can address this serious complication [10].

Conclusions

A higher level of knowledge on PTD was exhibited by women who obtained information on this issue from a midwife, physician, or family/friends. Therefore, there is a need to educate the pregnant woman about the risk factors of PTD.

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Conflict of Interest

The authors declare no conflict of interest.

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