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Research Article

Coverage of Intermittent Preventive Treatment of Malaria in Pregnant women in Congo

Couverture du traitement préventif intermittent du paludisme chez les femmes enceintes au Congo

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Mots clés : paludisme, prévention, femmes enceintes, Traitement Préventif Intermittent, Sulfadoxine - Pyriméthamine.

ABSTRACT

Introduction. Intermittent Preventive Treatment with Sulfadoxine-Pyrimethamine (IPT-PT) for pregnant women is one of the measures recommended by the WHO for the prevention of malaria in mothers and newborns. The aim of this study was to investigate the coverage of IPT-SP in the Republic of Congo. **Methodology.** This was a descriptive cross-sectional study in urban and rural health districts of the Republic of Congo. Survey data were entered using CS Pro 7.5 software, then processed and analyzed using SPSS 26 software. **Results.** A total of 1,800 women and 64 health facilities participated in this study. These women ranged in age from 15 to 49 years, with an average age of 26 ± 6 years. Antenatal care, including IPT-SP, showed a utilization rate of 92.44%. Paradoxically, however, malaria prevention coverage with this drug was 30.95%, below the threshold recommended by the WHO. **Conclusion.** IPT-SP coverage among pregnant women in the Republic of Congo is low, with major disparities between departments. This situation constitutes a risk in terms of maternal and neonatal morbidity and mortality. The administration of this treatment should be systematic and integrated as a public health intervention at the time of antenatal care.

RÉSUMÉ

Introduction. Le traitement préventif intermittent à la Sulfadoxine-Pyriméthamine (TPI-SP) pour les femmes enceintes est l'une des mesures recommandées par l'OMS pour la prévention du paludisme chez la mère et le nouveau-né. L'objectif de cette étude était d'étudier la couverture du TPI-SP en République du Congo. **Méthodologie.** Il s'est agi d'une étude transversale descriptive dans les districts sanitaires urbains et ruraux de la République du Congo. Les données de l'enquête ont été saisies à l'aide du logiciel CS Pro 7.5, puis traitées et analysées à l'aide du logiciel SPSS 26. **Résultats.** Au total, 1800 femmes et 64 formations sanitaires ont participé à cette étude. Ces femmes étaient âgées de 15 à 49 ans, avec une moyenne d'âge de 26 ± 6 ans. Les soins prénatals, y compris le TPI-SP, ont montré un taux d'utilisation de 92,44%. Paradoxalement, la couverture de la prévention du paludisme avec ce médicament était de 30,95%, en dessous du seuil recommandé par l'OMS. **Conclusion.** La couverture en TPI-SP chez les femmes enceintes en République du Congo est faible, avec des disparités importantes entre les départements. Cette situation constitue un risque en termes de morbidité et de mortalité maternelle et néonatale. L'administration de ce traitement devrait être systématique et intégrée comme une intervention de santé publique au moment des soins prénataux

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KEY FINDINGS

What this study adds to our knowledge

- IPT-SP coverage (with a reference value of three doses) remains very low. It fell from 12.2% in 2015 to 7.5% in 2018, while 83.7% of pregnant women had at least 4 antenatal care contacts during the same period.
- Antenatal care, including IPT-SP, showed a utilization rate of 92.44%.
- Malaria prevention coverage with this drug was 30.95%, below the threshold recommended by the WHO.

How this is relevant to practice, policy or further research.

- The results of this research should help national programs and health districts to optimize interventions related to antenatal care and malaria prevention in pregnant women.

INTRODUCTION

Malaria is a major public health problem worldwide. According to the WHO, the African region is responsible for almost 90% of malaria cases and 91% of deaths worldwide [1]. It is a disease with serious consequences for the mother, the fetus and the newborn, which during pregnancy is responsible for 20% of all neonatal deaths in Sub-Saharan Africa, and 10,000 maternal deaths worldwide in 2016 [1].

In 2019, malaria affected 35% of pregnancies registered in countries in the WHO African region. In the same year, its incidence among pregnant women was 40% in Central Africa, 39% in West Africa and 24% in Eastern and Southern Africa [3].

To limit this situation, the WHO recommends intermittent preventive treatment (IPT) with Sulfadoxine Pyrimethamine for malaria during pregnancy. Evidence confirms that this treatment is a useful and effective intervention. Pregnant women should receive at least three doses. Administration is recommended at amenorrhea weeks 20, 26, 30, 34, 38 and 40. This treatment is not recommended at 38 and 40 weeks of amenorrhea, if the last dose was taken at 34 weeks [4].

This recommendation concerns prenatal care, which is now a minimum of eight visits per pregnant woman, instead of the four previously provided [5].

In the Congo, as in most countries, the fight against malaria is based on case management in line with recommended therapeutic protocols, vector control, distribution of long-acting insecticide-impregnated mosquito nets (LLINs) and IPT for pregnant women.

Despite the implementation of measures relating to free malaria care and the application of WHO recommendations, IPT-SP coverage (with a reference value of three doses) remains very low. It fell from 12.2% in 2015 to 7.5% in 2018, while 83.7% of pregnant women had at least 4 antenatal care contacts during the same period [6].

In Congo, few studies have so far been conducted to investigate IPT coverage with Sulfadoxine Pyrimethamine (IPT-SP) in pregnant women.

The aim of this study was to estimate the coverage of IPT-PM in the Congo. The results of this research should help national programs and health districts to optimize interventions related to antenatal care and malaria prevention in pregnant women. This will be achieved by encouraging the promotion, use and appropriation of IPT-SP in order to reduce morbidity and mortality rates due to malaria.

METHODOLOGY

Type, period and location of study

This was a descriptive cross-sectional survey, conducted from September 1st to December 10th, 2021 in urban and rural areas, then in first-level health facilities in the Republic of Congo.

Survey framework

The survey was conducted in households and public and private health facilities in urban and rural areas, comprising integrated health centers and their private equivalents.

Target populations

Two distinct populations were targeted by this study:

- women aged 15 to 49 who were at least five (5) months pregnant at the time of the study, or who had given birth no more than six (6) months previously;
- health facilities in the health districts frequented by the women surveyed.

Selection and sample size

WHO-type stratified cluster sampling used an urban and rural stratum of thirty (30) clusters each. The sample size of each stratum was calculated according to the prevalence of the third dose of IPT-SP coverage in 2018 in Congo, which was 7.5%. Daniel SCHWARTZ's formula below was used to calculate this size :

$$N=(u_{\alpha})^2 \frac{\pi_{y(1-\pi_y)}}{\Delta^2} \; x \; C$$

N= size of sample to be examined ;

u_α= reduced deviation for the statistical risk taken (alpha= 5%, u_α=1.96) ;

π_y= assumed frequency of the phenomenon studied. It is estimated at 7.5%;

1-π_y= complementarity of the proportion of the phenomenon studied;

Δ= precision with which we wish to estimate the frequency of the phenomenon within the population (0.03);

C = correction coefficient for the cluster effect, set at 2 in our study.

This gave a sample size N of 888 for each stratum. The number of statistical units to be interviewed in each cluster is 888/30 = 29.6, i.e. a cluster size of 30 women, leading to a readjusted sample size of 900 (30 x 30 clusters) subjects per stratum. The sample size of women to be enrolled in the survey was thus set at 1,800.

Data entry, processing and analysis

Survey data were entered using CS Pro 7.5 software, then processed and analyzed using SPSS 26 software. The analysis consisted in dividing each variable into categories, then performing the calculations with all pregnant women and women who had already given birth included in the study as the common denominator. Absolute and relative frequencies (proportions) were reported for categorical variables. Pearson's Chi-2 (χ^2) test was used to compare categorical data between groups. For

quantitative variables, central tendency parameters (mean ± SD, median) were estimated for variables with a normal distribution, and dispersion parameters (Quartiles and Standard deviation) for variables with a non-normal distribution. Student's t-test was used to compare continuous data.

In line with WHO guidelines, the country's reproductive health standards and procedures recommend taking at least three doses of IPT-SP from the 20th week of amenorrhea, with a minimum interval of one month between doses. IPT-SP coverage is considered good when the pregnant woman has taken at least three doses by the end of her pregnancy. Otherwise, coverage is considered low [7].

Ethical and administrative considerations

The informed consent of each woman interviewed was required prior to any interview. Confidentiality of information was guaranteed by the anonymity of data collection media. At administrative level, an information note on the organization of the survey was sent to local authorities and departmental health directorates by the Ministry of Health. The latter also produced an official press release to inform the public about the organization of the survey and invite them to participate.

RESULTS

Socio-demographic characteristics

A total of 1,800 women took part in the study. These women ranged in age from 15 to 49 years, with an average of 26 ± 6 years. The majority were under 30 (67.7%), and 15.9% were under 20, including 11.5% under 18. The breakdown by place of residence shows that 53% of them came from rural areas, compared with 47% from urban areas.

Nearly 1,631 participants (90.61%) were enrolled in school, compared with 166 (9.22%) who were not. Of those who had attended school, almost 16% had not obtained a diploma. Most of them were living common-law (58%), and only 24% lived alone.

In terms of professional status, the participants generally had vulnerable jobs, including 20.8% in petty trade, 23.8% in household activities, 14.2% in informal work, and others.

Use and provision of antenatal care services

Antenatal care, including IPT, shows that 92.44% of women surveyed had at least one antenatal care contact. The majority of pregnant women had two contacts (25.3%), followed by those with four or more contacts (24.22), three contacts (21.42%) and finally one contact (20.18%).

Only 57.9% of women who had already given birth completed the minimum program of four antenatal care contacts; 19.9% had three; 10.7% had two and 4.41% only one.

Table 1: Distribution of respondents by number of antenatal care contacts

Number of prenatal visits	Women who gave birth (%)	Pregnant women (%)	All (%)
Not at all	7,08	8,88	7,56
One time	4,41	20,18	8,66
Two time	10,71	25,3	14,65
Three times	19,9	21,42	20,31
Four times or more	57,9	24,22	48,82
Total	100	100	100

At the time of the survey, 72.1% of the facilities visited had a stock of SP and 27.9% were out of stock. The duration of these stock-outs varied from less than 7 days to more than 6 months. These SP stock-outs mean that the IPT-SP service is not available for more than a quarter of the facilities surveyed.

IPT-SP coverage

Overall, only 30.95% of women surveyed had good IPT-PS coverage. For all the others (69.05%), coverage was poor. This low level of coverage masks major inequalities between departments in the Republic of Congo. Coverage varies from 9.79% in Sangha to 63.33% in Bouenza. And the low IPT-SP coverage is most pronounced in the Cuvette-Ouest department (90.21%). The figure below details the distribution of IPT-SP coverage rates by department.

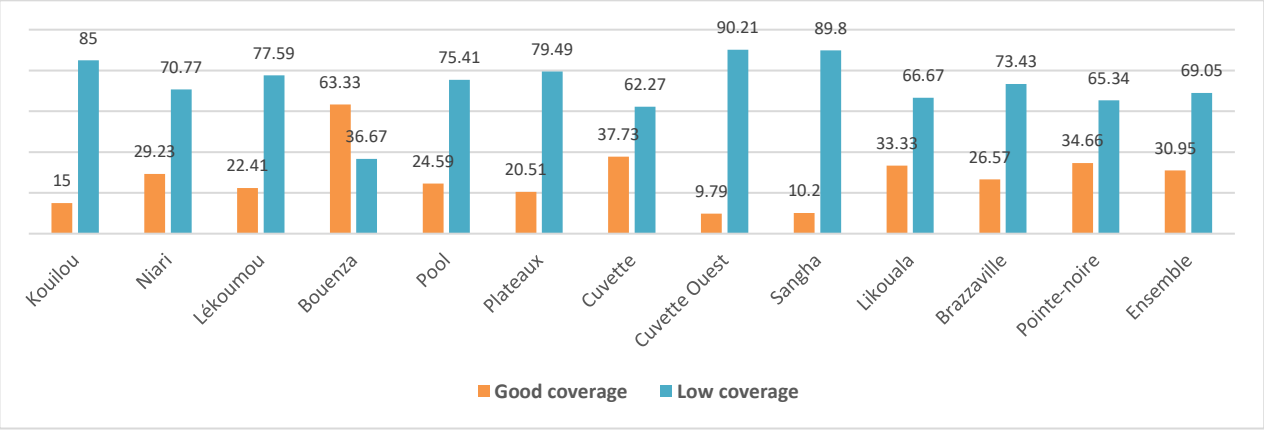

Figure 1 : Distribution of IPT-SP coverage rates by department

Sulfadoxine pyrimethamine availability and supply instructions in health facilities

Of the 64 health facilities included in this study (31 in urban areas and 33 in rural areas), 72.1% had a stock of Sulfadoxine pyrimethamine and 27.9% were out of stock for periods ranging from less than 7 days to more than 6 months.

Data on the supply of IPT-SP show that almost 50.8% of all healthcare personnel surveyed were aware of the technical guidelines for the administration of IPT-SP. While written instructions on IPT-SP standards and procedures were more available in rural areas (56.7%) than in urban areas (35.5%).

DISCUSSION

This is the first large-scale national study on this topic, involving both health facilities and their users in the prevention of malaria by IPT-SP. Indeed, the instructions relating to prenatal care standards and procedures recommend that this treatment be administered in the presence of the nursing staff, to ensure better compliance [7].

Socio-demographic characteristics

Of the 1,800 women who took part in this study, 53% lived in rural areas, compared with 47% in urban areas, and the average age was 26 ± 6 years, ranging from 14 to 49 years. These characteristics reflect national demographics in the Republic of Congo, where the population is increasingly young and fertility is proportionally higher in rural areas. This could be explained by the absence of structures such as colleges, formal jobs, leisure centers and the like in rural areas, which could keep women of childbearing age busy in preparing their socio-professional careers.

The socio-professional status of the women surveyed, characterized by vulnerability in terms of employment or marital status, constitutes a perinatal risk factor, as well as a social gradient in perinatal health. Some situations of vulnerability prior to birth are often the cause of multidimensional imbalances that can threaten a woman's health during pregnancy [9].

The mean age of the women in our study is similar to that observed in a hospital study of IPT-SP in Burkina-Faso, which was 26.0 ± 6.45 years (extremes 13- 43 years) [8]. The early onset of pregnancy observed is a growing trend that implies a commitment to promoting family planning, both at central and health district level. As in our study, the rate of good IPT-SP coverage was lower among very young pregnant women (30.35% among under-20s in the Republic of Congo versus 21.3% among under-18s in Burkina-Faso). This youthful tendency could be attributed both to a lack of experience in managing maternal and child health risks, and to the low number of contacts with health facilities. Greater awareness of the complications of malaria during pregnancy should be a major objective of malaria control programs. Prenatal care, which includes IPT-SP as part of primary health care, should take into account the overall health of pregnant women, and include social support to protect mother and child.

Use and provision of antenatal care services

In our study, the frequency of use of antenatal care was 92.44%. Prenatal care helps reduce the risks to pregnant women, thereby guaranteeing the health of both mother and child, especially as most of the risk factors associated with pregnancy can be detected at this time. Primary health care in the Republic of Congo involves the integration of information, education and communication actions aimed at pregnant women, to improve their knowledge and attitudes to preventive care, including malaria prevention through IPT-SP.

Increasing the rate of antenatal care use would depend on early contact with health facilities for the care of pregnant women. This would make it possible to have at least four contacts and thus receive the recommended doses of SP [11]. Paradoxically, despite the availability of antenatal care in all the health facilities included in this study, the rate of use of this care is inversely proportional to the availability of SP.

In fact, the fact that 27.9% of facilities are experiencing SP stock-outs is a de facto sign that the service is unavailable.

Furthermore, even when the drug is available, treatment is not always administered in accordance with reproductive health standards and procedures, given that most women (74%) have taken their treatment at home. This observation is in line with the findings of work carried out in Nigeria, which advocates direct administration of SP tablets by a health worker as a solution that can optimize anti-malarial preventive compliance [12].

IPT-SP coverage among women surveyed

This study showed that IPT-SP coverage was 30.95%. This rate is below the IPT-SP target of at least 80%. This is explained by a low level of compliance with WHO policy on the prevention of malaria in pregnant women by IPT-SP [13]. Further studies are needed to investigate the causes of this low level of coverage, despite the high level of access to antenatal care.

However, this result shows an improvement in the coverage rate compared with 2015 and 2018, when it was estimated at 12.2% and 7.5% respectively. This is a significant development in a global context which, at the time of the study, was marked by the COVID-19 pandemic, the effects of which translated, among other things, into a weakening of various national health services and programs.

This national coverage rate conceals major disparities between geographical areas or departments. With the exception of Bouenza, which has the lowest coverage rate (36.67%), this indicator is above 60% in all other departments. It reaches 90.21% in Cuvette-Ouest and 89.8% in Sangha. This low coverage jeopardizes efforts to reduce maternal, neonatal and infant mortality rates in the Congo. And this risk is all the more real as the present results also establish, as elsewhere, the link between low birth weight and low IPT-SP coverage.

This rate is slightly lower than the 34.08% observed in urban areas of Benin [14]. Although this comparison needs to be made with great caution, given the geographical extent of the population studied, we note that

IPT-SP coverage in urban areas of Benin was better than that found in urban areas of Congo (low coverage of over 60%).

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Declaration of interest

The authors declare that they have no ties of interest.

CONCLUSION

This study revealed low coverage of IPT-PH among pregnant women in the Republic of Congo, with significant disparities between departments. Urgent efforts are needed to ensure the availability of SP in all health facilities offering prenatal care, and their compliance with established reproductive health standards and procedures. All these efforts should be undertaken in the context of strengthening health districts. In-depth studies should be carried out to better understand the factors behind this low coverage, in order to adapt effective corrective measures.

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