

**UNDERUTILIZATION OF MAGNESIUM SULFATE CASE OF THE KENITRA
PROVINCE BETWEEN 2010 AND 2014**

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ABSTRACT

Background: If eclampsia is the second direct cause of maternal deaths in the international and national levels, Kenitra made except by recording this complication as a leading cause of maternal deaths in the province, with a percentage of 42.9%. An alarming figure that intersects with an underutilization of magnesium sulfate (SO₄Mg), despite its importance in improving the health status of pre-eclamptic and eclamptic women. **The objective of this work:** Describe the factors associated with the underutilization of magnesium sulfate by midwives, nurse midwife and doctors from the six birthing centers in Kenitra province during the 2010-2014 period. **Materials and Methods:** With exhaustive sampling, this study used two measuring instruments. On the one hand, a self-administered questionnaire with 32 people, with a response rate of 100%. On the other hand, interviews with a responsible of the reference maternity of kenitra, a resuscitator of the provincial hospital, and a resource person at the network of basic health care in Kenitra. **Results:** According to the results of this study, 71.43% of participants do not use magnesium sulfate, against only 28.57% who use it. And among those they use 38.10% reported their dissatisfaction with its use. This is due to a number of factors: a) team dynamics and interpersonal relationships that occurred in 52.38% of responses. b) The need for quality continuing education raised by 52.38%. c) The perception of magnesium sulfate as a danger illustrated in 80.95%. d) The fear of this drug noted in 61, 90%. e) The medico-legal reasons identified in 61.91% of the answers as factors in the non-use of magnesium sulfate. f) The non-existence of a law authorizing its use in 95.24%. g) The legal framework for the practice of midwives in 85.72%. h) The risk of legal proceedings reported by 61.91%. i) The effective of staff is recorded in 80.95%. j) The working conditions raised at 71, 43%. k) The non-involvement of doctors in the decision to use this drug in 66.67%. l) The quality of communication between the delivery house and the reference maternity in 52.38% And, m) transfer barriers advanced by 71.43% of participants in this study. **Conclusion:** Since magnesium sulfate is an effective therapeutic that is at the forefront of anticonvulsants, the results of this study demonstrate the need to federate the government and local efforts to deal with its underutilization.

KEYWORDS: Magnesium sulfate, underutilization, midwives, nurse midwife, doctors, birthing centers.**INTRODUCTION**

Hypertensive gravidic disorders represent a significant public health problem in the world and pre-eclampsia is the most common form.^[1] These disorders are estimated at between 5 and 10% in developed countries and 18% in some developing countries.^[2] Thus, pre-eclampsia remains the leading cause of maternal and perinatal morbidity and mortality worldwide.^[3] In some developing countries, it is responsible for 40 to 80% of maternal mortality. In fact, perinatal mortality is five times higher in women with this obstetrical complication.^[4]

Treatment of pre-eclampsia is based on a combination of anticonvulsant drugs, including magnesium sulfate (SO₄Mg). The latter has been proposed for the treatment

of seizures of eclampsia but also for prophylaxis in pre-eclampsia.^[5] Indeed, Maurice, et al (2005) demonstrated that magnesium sulfate is a vasodilator with no hypotensive effect, which at therapeutic doses corrects the abnormally low level of activity of the intracellular Magnesium Adenosine Triphosphatase (Mg-ATPase) enzyme in women with eclampsia.^[5] As it allows the improvement of renal and placental perfusion. Moreover, this drug is able to cross the placenta without altering it and significantly reduce the incidence of recurrent seizures.^[5]

Conscious of the virtues of magnesium sulfate, and considering that, pre-eclampsia and eclampsia come in second place on the list of direct obstetric causes of maternal deaths in Morocco, with a percentage of 18.2%.

Moreover, they come in second cause Intra-hospital deaths with 25.7% of total deaths.^[6] The Moroccan Ministry of Health introduced magnesium sulfate at the level of delivery structures in several stages.^[7]

The national report of the confidential survey of maternal deaths in Morocco (2010) reported that 89.1% of eclampsia deaths were preventable and that 24.1% of factors responsible for eclampsia deaths are due to inadequate therapeutics decisions. Demonstrating that the health system could not prevent them, despite efforts to cope with this complication. Moreover, based on a survey carried out by the Directorate of Population only 1420 bottles were used on 23576 received, or only 6% of the number received.^[8] Similarly, the assessment system of resources and the monitoring of obstetrical and neonatal emergency care found that of the 581 birthing structures with magnesium sulfate, only 322 structures use it, or only 48, 6% who use it.

Some regions, particularly Kenitra and Hay Hassani in Casablanca, seem to be the first regions most affected by this underutilization.^[9] The Gharb-Chrarda-Beni Hssen region recorded eclampsia and pre-eclampsia in the first order of direct obstetric causes of maternal deaths, with a percentage of 42.9%,^[10] making the exception, because at national and international level the percentage of deaths due to these complications does not successively exceed the second and third place on the podium of these causes. In 2011, this region reported 317 cases of severe pre-eclampsia and eclampsia, including 58.99% of cases reported by the province of Kenitra.^[11] And that 229 cases of pre-eclampsia and eclampsia were recorded by the latter during the year 2012, of which 164 cases referred from the six delivery centers to the hospital structures, and of these 164 cases only 29 cases have received a dose of Magnesium sulfate prior to transfer, or only 17.68% of the eclamptic women transferred.^[12]

As Laghzaoui's study,^[9] has raised, Kenitra referral hospital staff complain about the condition of patients transferred from delivery centers without a dose of Magnesium Sulfate. The purpose of this study was to describe the factors associated with the underutilization of magnesium sulfate by midwives, nurse midwife, doctors from the six birthing centers in the province of Kenitra.

MATERIAL AND METHODS

This is an exploratory descriptive study to describe the factors associated with the underutilization of magnesium sulfate by midwives, nurse midwife, and doctors from the six birthing centers in the Kenitra province during the period 2010-2014.

Population of the study

This study targeted all health professionals with a role in the management of pre-eclampsia and eclampsia cases at the six birthing centers in Kenitra province. In order to complete the information, interviews are conducted with

the head doctor of the reference maternity and the resuscitation chief resuscitator at the Kenitra Provincial Hospital, who receives the cases of pre-eclampsia and eclampsia transferred from the six birthing centers. As well as with a resource person at Kenitra's network of basic health care.

Inclusion criteria

In this study were Included all midwives, nurse midwife, and doctors who care for the delivery at the six birthing centers in Kenitra Province.

Exclusion criteria

In this study were excluded, midwives, doctors and nurse midwife who are not delivery, and that are affected in other care units. As well as, participants in the validation test of the questionnaire used in the survey.

Data collection

The study was conducted through a questionnaire on participant information. Such as age, sex, profile, seniority in the job, knowledge of magnesium sulfate, participation in drug training, use of magnesium sulfate, satisfaction with its use, constraints preventing its use, the quality of team dynamics at the level of care structures, and external communication. These data were supplemented by interviews with three people. The interview guides included questions about the use of magnesium sulfate between the provincial maternity hospital and birthing centers, how to monitor its use in these structures, the future of eclampsia and pre-eclampsia referred to the provincial hospital for care.

Ethical considerations

The Ethics Committee of the Faculty of Medicine and Pharmacy of Rabat and the Chief Medical Officer of the basic health care network gave their authorizations for the realization of this study. Informed consent was obtained from each professional at the time of entry into the study. Participation in the study was free. Confidentiality and anonymity were respected.

Definition of terms

Eclampsia

Defined by a syndrome specific to pregnancy, eclampsia is evidenced by a high blood pressure (diastolic ≥ 90 mm Hg with or without systolic BP ≥ 140 mm Hg), developing after 20 weeks of pregnancy and accompanied by appearance of protein in the urine.^[13] It is a progressive condition ranging from moderate to severe, which can lead to a cerebrovascular accident, kidney or liver failure and blood clotting problems. Without treatment, moderate pre-eclampsia can very suddenly progress to more serious and potentially life-threatening conditions of eclampsia, such as post-critical coma, neurological complications, as well as stunting prematurity and possible hypoxia for the fetus. Maternal and fetal death is not to remove from the life-threatening picture.^[13]

Respondents' knowledge

The knowledge of the respondents in this work is apprehended through the analysis of their information concerning the magnesium sulfate mode of action.

The team dynamics

In this work, team dynamics refers to the dynamic force that drives the work of healthcare professionals at the health care structures. It is apprehended in this work by the verification of the following elements: the collective and individual reflection with regard to the prescription of medicines and the care offer; consensus in decision-making; the quality of internal communication; and the organization of the management of obstetric complications.

External communication

In this work, the external communication designates all the actions made by the province of Kenitra, and the role of the reference maternity to support the health professionals in the context of the use of magnesium sulfate. And the effect of this support on the use of the latter. Support is measured by the availability of

communication networks between the network of basic health care and delivery centers and the Kenitra reference maternity.

Statistical Analysis

The information collected by the questionnaire was compiled manually and presented on excel in the form of a table and graphs for later analysis. The data collected by the interviews were recorded and transcribed as the interviews were conducted. The processing of the collected data was carried out through the exploitation of the interviewees' verbatim, and via the exploitation of data collected by questionnaires using sphinx and Excel software.

RESULTS

The study highlighted a number of factors that hindered the use of magnesium sulfate by midwives, nurse midwife and doctors at the six birthing centers in Kenitra province. These factors are subdivided into three categories: health professional factors, institutional system factors, and organizational barriers factors.

Flow chart of the study

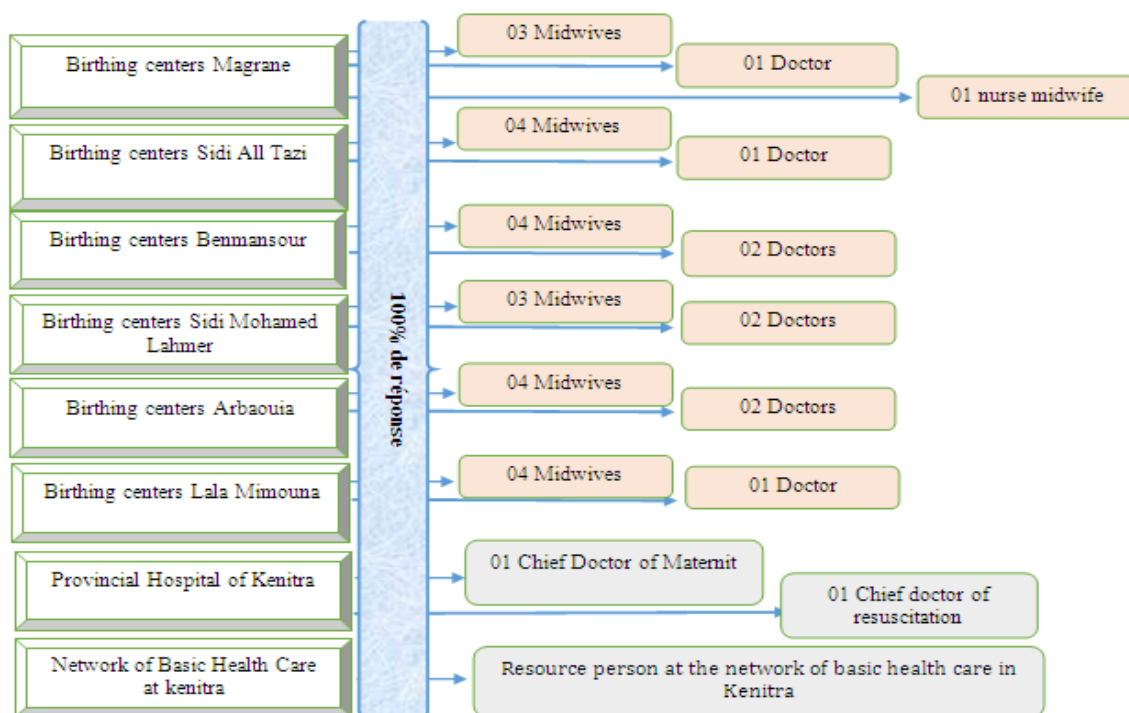


Figure 1: Summary of the flow of health professionals participating in this study Characteristics of health professionals participating in this study.

The results in Table 1 show that the age groups of the respondents were [30years, 40years [in 46.87%, [20years, 30years [in 40.62%, and [40years, 50years] in 12, 5%. Midwives accounted for 68.75% of respondents, doctors accounted for 28.13% and nurse midwife accounted for 3.12%. The seniority of the respondents in the position was less than 5 years in 53.12%, between [5

years, 10 years] in 37.5% and more than 10 years in 9.38%.

Table 1: Characteristics of health professionals participating in this study.

Variables	Health professionals N = 32	
	Effective	Percentage (%)
Age groups of respondents		
[20 years, 30 years]	13	40,62
[30 years, 40 years]	15	46,87
[40 years, 50 years]	4	12,5
Profile of participants		
Midwives	22	68,75
Nurse midwife	1	03,12
Doctors	9	28,13
Seniority of the respondents in the job		
<5years	17	53,12
[5 years, 10 years]	12	37,5
>10 years	03	9,38

Information on the use of magnesium sulfate

According to figures 1, 2, 3, 4 and 5, magnesium sulfate was available at all birthing centers in this study. 9.52% of delivery centers did not have calcium gluconate. 71, 43% of respondents did not use magnesium sulfate. . Including 28.57% of the participants who reported use,

38.10% were not satisfied. 100% of pre-eclampsia and eclampsia cases were transferred to the reference maternity hospital after treatment. 47.62% of participants administered valium, 23.81% a simple saline infusion, and 28.57% magnesium sulfate.

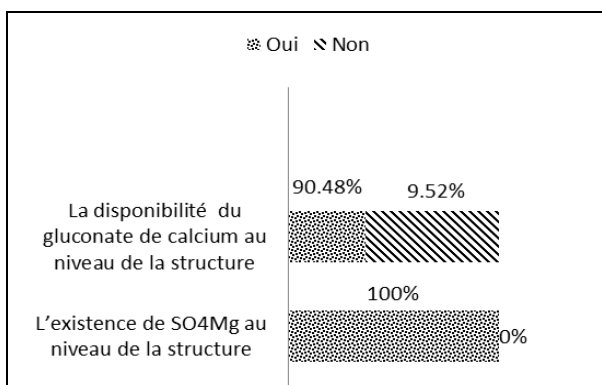


Fig. 2: The availability of SO4Mg and its antidote at birthing centers.

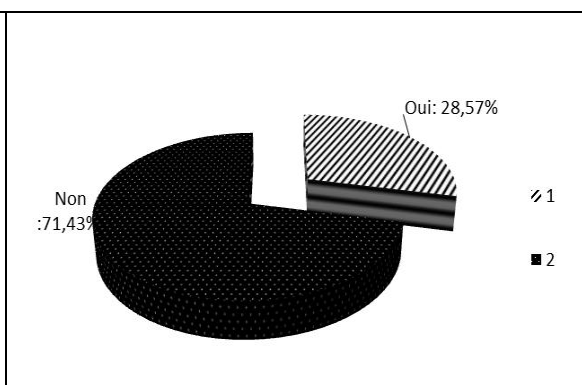


Fig. 3: The use of magnesium sulfate by study participants.

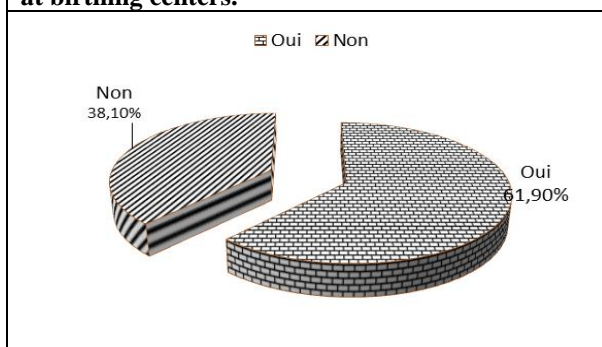


Fig. 4: Satisfaction with the use of magnesium sulfate.

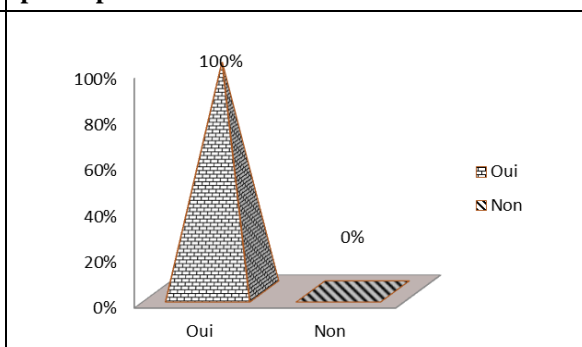


Fig. 5: Administration of a particular treatment before the transfer.

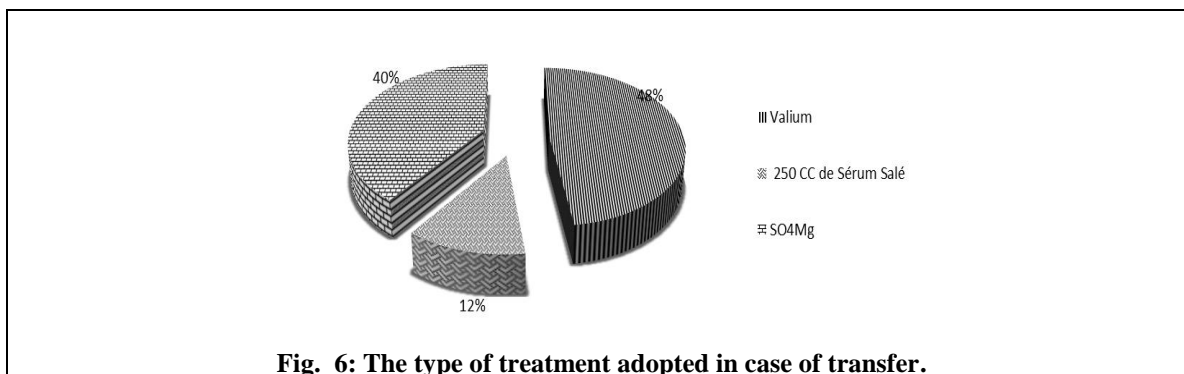


Fig. 6: The type of treatment adopted in case of transfer.

Factors related to health professionals

According to the following figures, 100% of the providers who did not use magnesium sulfate considered it as acts of the resuscitator. Among the participants who did not use magnesium sulfate, 23.80% did not answer the question related to magnesium sulfate knowledge, and 9.53% among them have advanced mistaken answers, for example, by saying that magnesium sulfate serves to moisturize the eclamptic woman. 47.62% of participants said they did not receive training on magnesium sulfate. 52.38% of participants who did not

Quantitative results

use magnesium sulfate indicated their willingness to change their routine behavior regarding the support of pre-eclamptic and eclamptic women, provided they receive quality training on this medicine. Team dynamics and interpersonal relationships influenced the decision to use magnesium sulfate in 52.38% of cases. 80.95% of participants thought that magnesium sulfate could not be safe. In addition, the fear of this drug emerged as a factor of its underutilization by 61,90% of the participants who does not use it.

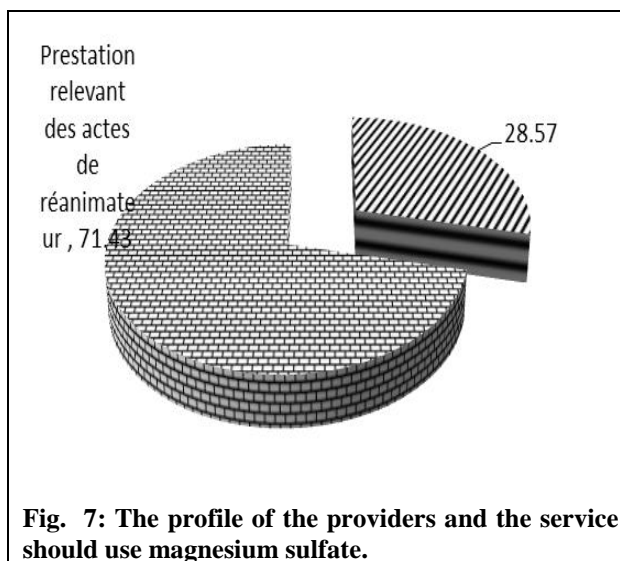


Fig. 7: The profile of the providers and the service should use magnesium sulfate.

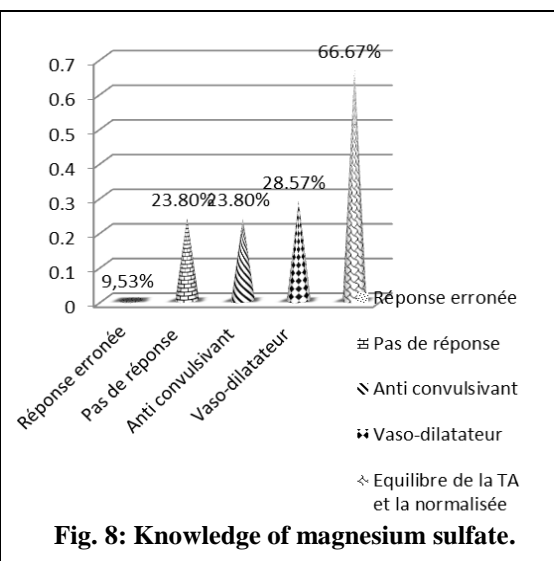


Fig. 8: Knowledge of magnesium sulfate.

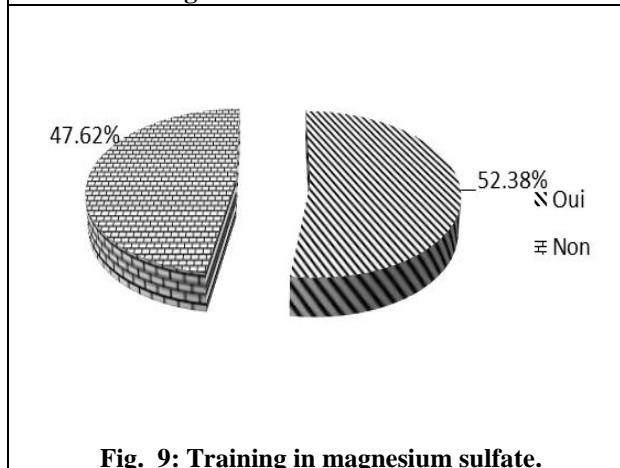


Fig. 9: Training in magnesium sulfate.

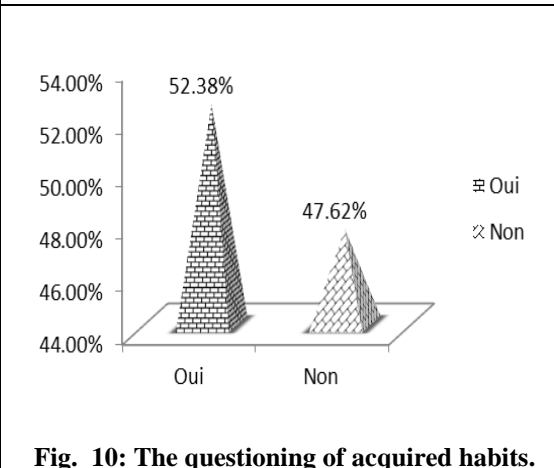
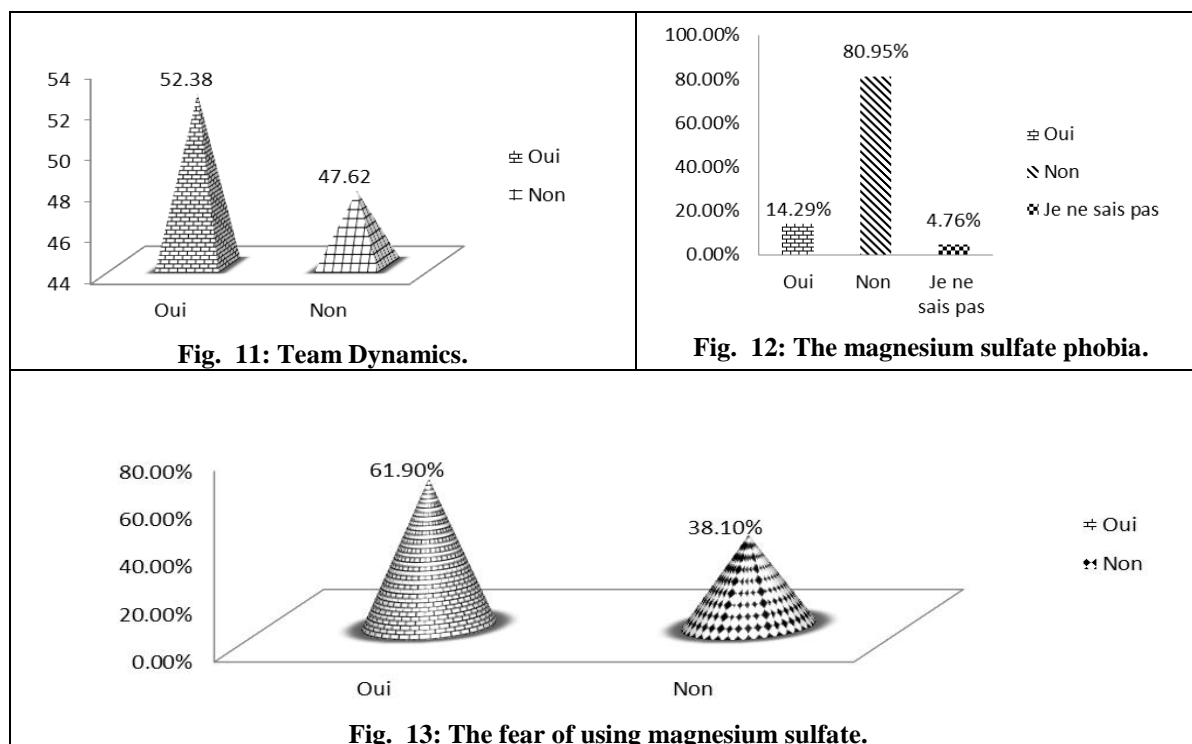


Fig. 10: The questioning of acquired habits.



Qualitative results

The interviews revealed a variety of factors leading to the underutilization of magnesium sulfate. In fact, one of the interviewees put forward the problem of profile as an obstacle to the non-use of SO₄Mg, because he found that the great majority of midwives wonder why they are forced to use this drug while birthing centers doctors are not "why am I obliged to use it the time the doctor does not do it? ".

Another factor raised by three interviewees, it is the influence of knowledge of the side effects of SO₄Mg on the non-use of this drug. As have advanced the presence of the antidote engenders among midwives negative perception towards magnesium sulfate. Because they perceive only these complications, resulting thus a reluctance to use "... there is an antidote for the SO₄Mg and consequently they perceive only the complications of this drug thus generating reticence with its use ... While they will not need this antidote, because the dose prescribed in the Protocol does not generate its use".

Information on the treatment. As one of the respondents put forward, the incorrect information on SO₄Mg leads to the non-use of this medication. "The poor knowledge of the influence and the mode of action of SO₄Mg on pre-eclampsia and eclampsia, as well as, the way in which it is used has a negative influence on the use of magnesium sulfate by providers at birthing centers ...".

The influence of continuing education on the use of this drug has been omnipresent in all interviews conducted. Through these interviews another aspect of continuing education emerged, the quality of training and the trainers competence selected in this context. "If you had

a trainer who says you pay attention to the SO₄Mg, systematically you will not use it ... ". " ... Even they received the training, they did not receive it correctly, because the quality of the training was failed ... To fill this gap and to dispel the reluctance of providers, the subject of SO₄Mg has become mandatory in all training organized for the benefit of birthing centers ... ".

One of the interviewees cited the team dynamic. "In some birthing centers, doctors do not get involved in the functions of these structures in a general way and in the support of eclampsia cases in a specific way. Thus, the doctor-midwife relationship at birthing center level is lacking. Taking for example the case of eclamptic references, the doctor asks the midwife to fill out the form and sometimes he does not even want to sign it. Similarly, midwives complain that doctors work part-time and in an emergency they do not answer their calls. In short, midwives work alone and as a result they are afraid to use the SO₄Mg ... "

Notwithstanding, the interviewees correlate fear with various causes, this factor remains omnipresent in the advanced of all these people. "Fear of complications is a factor in the non-use of SO₄Mg ...", "Fear of side effects and contraindications induces either a lack of training or poor training on SO₄Mg. . ", " ... There is a huge phobia between delivery center providers regarding the use of SO₄Mg ... ".

Factors related to the institutional system

Quantitative results

According to the results in Figure 13, participants who do not use magnesium sulfate reported, the inexistence of

the legislation authorizing its use in 95.24%, the failure of the frame legal practice of midwives in 85.72%, the risks of forensic prosecution in 61.91%, and the failure of the legal security of employment in 57.14%, as a factor influencing their decision.

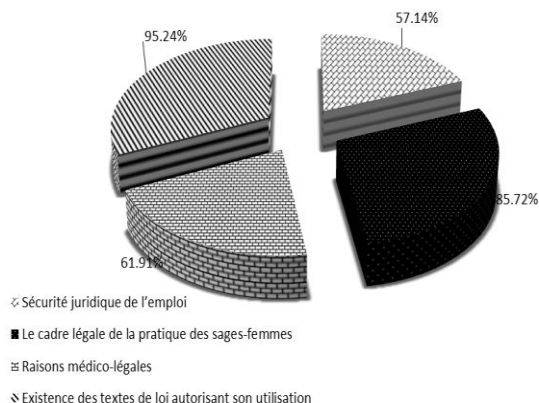


Fig. 14: Factors that influence the decision to use the magnesium sulfate.

Qualitative results

Institutional factors were raised with the three interviewees. Legal proceedings and the absence of legislation authorizing midwives to use SO4Mg are considered factors of the magnesium sulfate non-use. "... midwives are afraid of having a legal prosecution for complications caused by the use of SO4Mg ...". "When I explain to midwives if they use SO4Mg, they consistently save the woman lives, they answer me that in case of complication will they be covered. I cannot find an answer to their question because there are no clear laws on this subject, ambiguity reigns ...".

Factors related to organizational barriers

Quantitative results

According to the results presented on the graphs aroused, the factors that negatively influence the use of magnesium sulfate are several. The work overload in 66.67%. The reduced number of staff at the birthing center level in 80.95%. The lack of involvement of doctors in the support of pre-eclampsia or eclampsia cases in 66.67%. The lack of calcium gluconate at the delivery structure level in 85.71%. The inexistence of the ambulance in 76.19%. The poor condition of the transfer routes in 71.43%. And the lack of the fleet in 61,90%.

The quality of communication between the care team at the birthing center influenced the decision to use magnesium sulfate in 42.86% of cases. In addition, the quality of communication between the birthing center and the maternity hospital has an influence on the decision to use magnesium sulfate in 52.38% of cases. 57,14% of participants who do not use magnesium sulfate did not have a counter-reference for pre-eclamptic or eclamptic transfer.

95.24% of participants face obstacles when transferring pre-eclamptic or eclamptic cases. 100% of participants reported the problem of fuel and accompanying the transferred. 87.34% reported the existence of several deliveries at the same time at the birth center. 66.67% reported the delay in transferring the pre-eclamptic or eclamptic woman due to the delay of the family's agreement about the transfer. 40% of respondents suggested that the remoteness of the birthing center from the reference maternity is a transfer barrier. And 20% of participants cited the ambulances breakdowns.

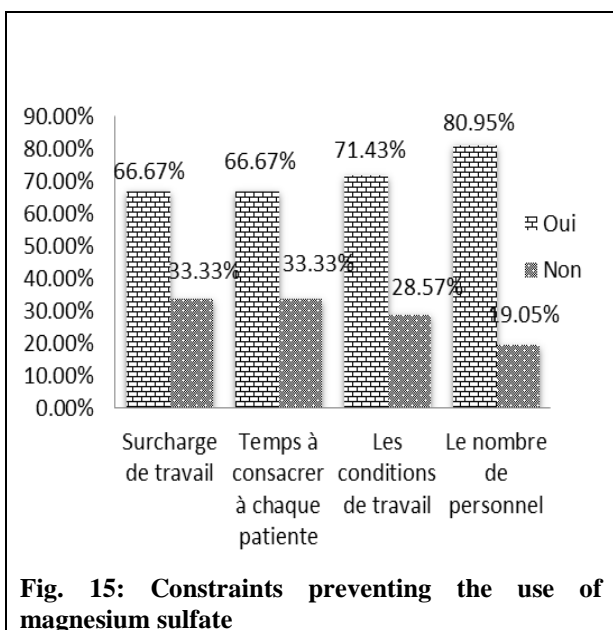


Fig. 15: Constraints preventing the use of magnesium sulfate

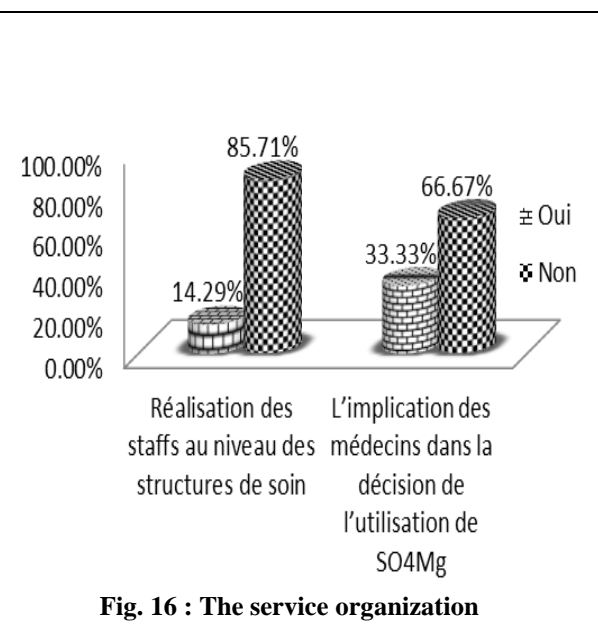


Fig. 16 : The service organization

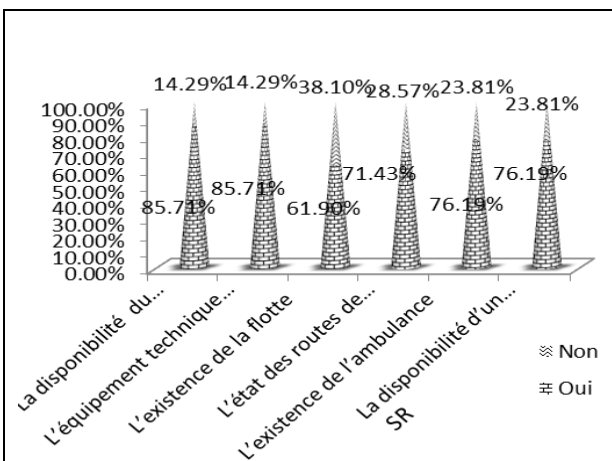


Fig. 17 : Factors that negatively influence the decision to use magnesium sulfate.

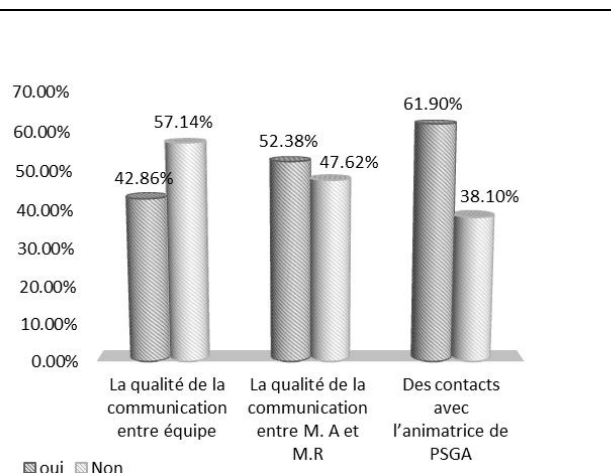


Fig. 18: Communication and its influence on the use of magnesium sulfate.

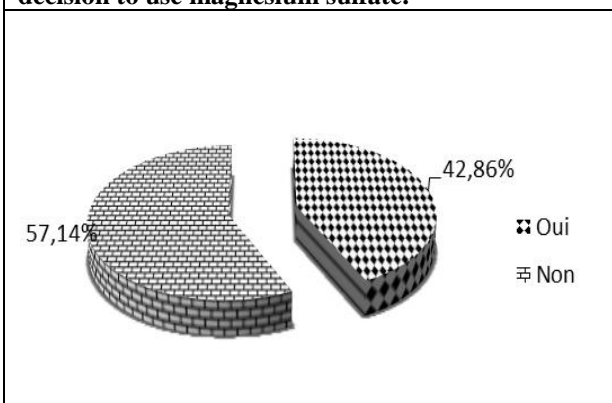


Fig. 19: Feedback between levels of care.

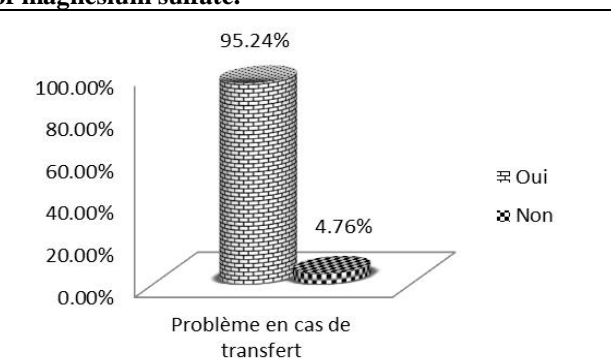


Fig. 20: Barriers confronted when transferring a pre-eclamptic or eclamptic woman.

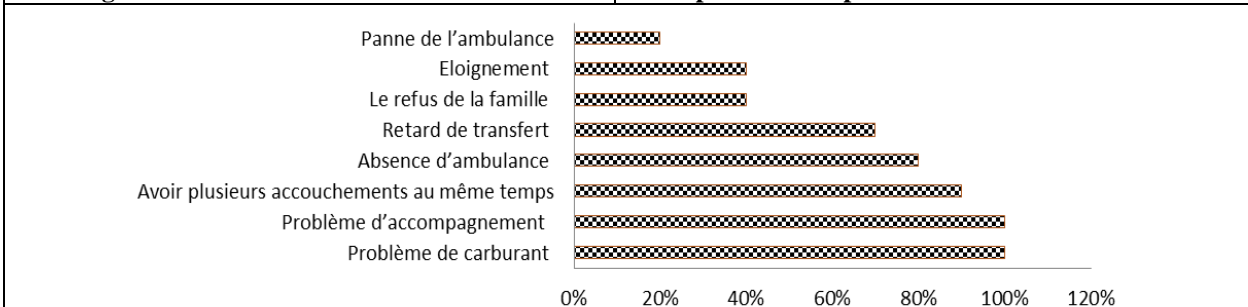


Fig. 21: Obstacles faced in the transfer of an eclamptic woman

Qualitative Results

According to the interviews carried out, work overload has an indirect influence on the use of magnesium sulfate. Because, there is only one midwife per guard, midwives do not use this medicine because they can not provide support for women eclampsia during transfer"... There are birthing centers that have a very high birth rate and there is only one midwife per guard, the midwives do not use SO4Mg because they can not support womens during the transfer ... ".

According to the statements made during the interviews, the communication with the birthing centers regarding magnesium sulfate is very favorable to its use. Indeed, accompaniment and supervision visits are carried out, maternal audits are carried out and meetings are

scheduled regularly with all the birthing centers "... Accompanying and support measures are regularly carried out for delivery homes in Kenitra province. In this sense, visits are made, in order to dispel the difficulties and to propose possible solutions, after these visits we organize visits to supervise the already existing platform. Also, we organize regular meetings with the staff of the birthing centers in a vision to discuss the state of operation of these structures, the subject of SO4Mg is always present. Similarly, in case of maternal death, audits are organized to discover the causes of death ... ".

The availability and even the existence of unmanned ambulances is a factor in the non-use of magnesium sulphate, "...The existence of an ambulance equipped to make a proper accompaniment of the eclamptic woman

will encourage the midwives to use the magnesium sulphate ...".

In the same way, the interviews showed that the fleet is lacking ".... *There is a problem with the fleet at the provincial level, because it is blocked ... I think to make it national ...*".

Regarding the antidote, one of the people interviewed stated "... *the birthing centers are systematically acquired with the antidote, knowing that in the majority of cases it will not be used. It's more to create psychological support to encourage the use of SO4Mg ...*".

One of the interviewees suggested that there is a poor filling of the reference cards, which does not allow midwives to know the future of the women transferred. Wearing this way prejudice at the decision to use the SO4Mg. "... *even if the cross-references are systematic, it should be noted that the cards of these counter-references are poorly filled which does not allow midwives to have a clear idea about the future of womens, this which can negatively influence the use of magnesium sulfate in the future*".

DISCUSSION

The results obtained via two measurement tools used in this study, namely the questionnaire and the interview guide, are discussed and analyzed in the light of the frame of reference developed from the literature review.

Factors related to health professionals

The study found that 71.43% of the participants do not use magnesium sulfate, because they consider that it is a resuscitators act. In addition, one of the interviewees recounted the problem of profile as a hindrance to the use of this drug, because he found that the vast majority of midwives contest the nonuse of SO4Mg by the doctors of their homes childbirth, the time when they are forced to use it. These results corroborate with the advances of the studies of Laghzaoui,^[9] Benazzouz,^[14] and WHO.^[15]

The lack of knowledge about magnesium sulfate explains the 71, 43% of non-use. The results of this study raised 23.80% of no response, 9.53% of the erroneous answers arguing that this type of drug is used to hydrate the eclamptic woman. Similarly, only 66.67% of participants know that this treatment balances blood pressure and normalizes it. Only 28.57% who recognize the vasodilating effect of magnesium sulfate. The anticonvulsant effect of the latter is recorded in only 23.80%. This corroborates the stipulations of the interviewees, when they argued that the incorrect information on SO4Mg leads to the non-use of this drug, as well as the results of the WHO,^[15] having declared that the lack of knowledge about treatment may induce improper use of the drug.

These deficiencies can be explained, among other things, by the fact that 47.62% of the participants in the study did not receive training on magnesium sulfate and that in the 52.38% of the participants who reported having had training, only 9.10% who had it as part of the basic training and more specifically in the context of medical training. In addition, even though 90.90% of the respondents stated that they had received training in this area as part of continuing training, the interviewees raised another aspect of continuous training, namely the quality of the training and the competence of trainers chosen in this context. They demonstrated that, even though the participants received the training, they did not receive it correctly, because for them the quality of the training was defective. This confirms the advances of WHO [15] and Pierre [16]. These studies believe that training plays a very important role in the acquisition of theoretical and clinical knowledge about the use of drugs, and is a determining factor in the adoption of treatment during the care of patients.

57.14% of respondents, who do not use magnesium sulfate, have stipulated that they do not want to change their decision about the use of this drug. While putting forward arguments among which it should be mentioned that this drug cannot be used in the absence of a doctor and they have nuances concerning its effectiveness. Similarly, 47.62% of these participants refuse to change their behavior because of the lack of legal framework that allows them to use it. This agrees well with the results of the WHO [15] and Pierre.^[16]

According to Lelièvre^[17] and WHO,^[15] the relationship between work colleagues and interpersonal relationships, of the different profiles that interact in therapeutic decision-making has a direct impact on the administration or not of a treatment. . Indeed, team dynamics and interpersonal relationships influence the decision to use magnesium sulfate in 52.38% of cases. Because for them the collaboration between doctor and midwife /nurse midwife will allow the sharing of knowledge and experiences; the making of appropriate decision regarding the use of SO4Mg; the having of a professional security; the having of an efficient and easy handover of instructions, the having of a regression of fears; and the solving of problems communication. As she can encourage the decisions making in a thoughtful way, thus giving better results. In addition, the interviewees reported that in some birthing centers this team dynamic does not take place because the doctor does not get involved in the functions of birthing centers in general and in the supporting of eclamptic women in a specific way. This forces midwives to work alone and as a result they are afraid to use magnesium sulfate.

Fear is expressed by 61.90% of non-users of magnesium sulfate. These participants link the fear of this drug in 90% to the side effects, and in 10% to the ambiguity of the regulatory framework and the status of the midwifery profession. Moreover, 80.95% of respondents believe

that magnesium sulfate cannot be safe. This fear was also pervasive in advanced of all interviewees. Indeed, they have stipulated that there is a huge phobia prevailing between delivery center and providers regarding the use of magnesium sulfate. This confirms the results of the WHO,^[15] which recorded phobia as a factor in the underuse of a drug.

Factors related to the institutional system

If the WHO^[18] and the Moroccan Ministry of Health^[11] have demonstrated the fear of prosecution, the legal security of employment, the medico-legal reasons, the obsolescence of the legal framework of the practice of midwives and the lack of legislation authorizing midwives to use magnesium sulfate as a factor in the under-utilization of this drug. The results of this study are no exception. For, participants who do not use magnesium sulfate declare several of these reasons. In 61.91% the medico-legal reasons as a factor influencing negatively their decision on this subject. In 57, 14% legal certainty as a determining factor. And in 100% the legal framework of the practice of midwives and the existence of the laws authorizing its use as factors influencing their decision to use the magnesium sulfate. Results corroborating the stipulated interviewees. They have argued that legal nuances in the use of this drug lead to ambiguities.

Factors related to organizational barriers

Among the organizational factors that negatively influence the use of magnesium sulfate, the study highlighted; staff complement with a percentage of 80.95%; working conditions with a percentage of 71.43%; the work overload and the time to devote to each patient with 66.67%. It should be noted that the respondents correlate their decision to do not use this drug with their presence alone in the delivery structures, which creates the lack of opportunity to accompany the eclamptic woman. A statement that certifies the advances of interviewees who said that overwork has an influence on the use of magnesium sulfate, there is only one midwife per guard. They do not use this medicine because it cannot provide support during transfer of the patient. Confirming, thus, the advanced studies of WHO,^[15] WHO^[18] and Khelif, and Safi.^[19]

In addition to the factors raised, the investigations also found the organization of service as factors in the underutilization of magnesium sulfate. Moreover, all non-users of this drug do not perform staffes to discuss the use of magnesium sulfate, as well as cases of pre-eclampsia and eclampsia. Similarly, 66.67% of midwives, who did not use this medication, expressed the non-participation of doctors in the management of the latter. And this, because they are not available 24-hour at the structure and they refuse to take such responsibility. This result converges with that of interviews having confirmed that doctors do not get involved in the functions of these structures in a general way and in the management of cases of pre-eclampsia

and eclampsia in a specific way. Crossing of this fact with the results of the study of khelif, and Safi.^[19] These two researchers have found that increasing responsibilities and poor service organization are causes of drug underutilization.

WHO^[15] and Miguil^[20] reported the infrastructure problem as a factor in the underuse of medicines. This fact is confirmed by the present study having highlighted a set of factors which have a negative influence on the decision to use magnesium sulfate and which are related to the characteristics of the service. In fact, 85.71% of the participants state that the non-availability of calcium gluconate in the delivery structure is able to influence their decision in this area. In addition, this study showed that the failure of birthing house technical equipment affects this decision in 85.71%, the absence of the ambulance and the non-availability of resuscitation at the level of the maternity reference in 76.19%, the poor state of the transfer routes in 71.43%, and the absence of the fleet in 61.90%. Figures that cross with the advanced interviewees raised as factors of non-use of magnesium sulfate; the existence of unmanned ambulances; and the problem of the fleet at the provincial level. However, the results of the questionnaire contradict the advances of the interviewees who state that the endowment of all birthing houses with antidote is systematic, although they know that it will not be used in the majority of cases.

According to Lelièvre,^[17] WHO,^[15] and Benazzouz,^[14] communication problems have a negative influence on the use of medicines. The same results were confirmed by this study because it showed that 42.86% of participants say that the quality of communication between the care team at birthing house level influences their decision to use magnesium sulfate.

In addition, the communication, between birthing home and maternity reference, is advanced by 52.86% of non-users of magnesium sulfate as factor affecting the decision to use this drug. These participants advance that the quality of this type of communication gives speed in decision-making. Because they think the gynecologist can inform, help and guide midwives to use easily this medicine. There are discrepancies between the results of the two data collection instruments used in this study. Indeed, if the interviews announced that the communication with the birthing houses regarding magnesium sulfate is very favorable, by means of the accompaniment and supervision visits which are carried out, maternal audits that are done and meetings which are scheduled in a regular way with all birthing centers. The results of the questionnaire showed that 38.10% of participants said they had no contact with the Kenitra Basic Health Network.

The feedback between levels of care in the management of pre-eclampsia and eclampsia is a key factor in the use of magnesium sulfate. Because the results of the questionnaire showed that 57.14% of participants do not

receive feedback after the transfer of an eclamptic woman, and 63.53% of these participants do not use magnesium sulfate. Similarly, one of the interviewees confirmed that, despite the fact that counter-referrals were made for pre-eclampsia and eclampsia cases referred, there is a poor filling of the reference cards, which makes it difficult for midwives to know the future of women transferred. Which negatively influences their decision to use the SO₄Mg. These results converge with those of Lelièvre,^[17] WHO,^[15] and Benazzouz.^[14] This works illustrated the negative impact of the lack of feedback between care levels on drug use.

The study found that the transfer of pre-eclamptic and eclamptic women encountered barriers in 95.24% of cases, all non-users of magnesium sulfate and 23.79% of users of this drug. Of the various obstacles encountered, it should be noted: problem of fuel and support of the transferred in 100% of the cases; existence of multiple deliveries at the same time at the birth center level in 87.34%; making decision by the family is not easy in 66.67%; the distance from the birthing house to the reference maternity hospital in 40%; and ambulance failures in 20% of the responses. This is in line with the results of the Lelièvre studies,^[17] WHO^[15] and Benazzouz,^[14] having confirmed that such factors influence therapeutic decisions and undermine the quality of care provided to patients.

CONCLUSION

Magnesium sulfate is an effective therapy, which ranks first anticonvulsants.^[21] Treatment that significantly reduces the incidence of maternal and neonatal morbidity.^[22] That is why promoting its use is a key action to improve maternal health. The present study is part of this vision, exploring the factors of the underutilization of magnesium sulfate by midwives, nurse midwife, and doctors in the province of Kenitra.

Indeed, the investigations of this study have highlighted a panoply of results that the literature review alleged. Observations mainly grouped under the aegis of 1) the absence of training in magnesium sulfate, 2) team dynamics and non-involvement of doctors in the use of this drug, 3) regulation and judicial repercussions in relation to the use of magnesium sulfate, 4) the quality of external communication and the obstacles of transfer. In addition, this study illustrated that these factors are responsible for 71.43% of non-use of magnesium sulfate by participants.

The major challenge of the 2015-2018 period was to dispel these factors of the underutilization of this drug through lucid and targeted actions both at the Kenitra province level and at the strategic level.

In conclusion, the federation of ministerial and local efforts is necessary for more efficiency. Similarly, since this study can not be extrapolated, further investigations

are needed at the national level, with an increase in the level of study and a generalization of results.

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CONFLICTS OF INTEREST

The authors stated that there are no competing interests.

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