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RESEARCH

Analysis of obstetric care provided by the Mobile Emergency Care Service

Análise dos atendimentos obstétricos realizados pelo Serviço de Atendimento Móvel de Urgência

Análisis de atenciones obstétricas realizadas por el Servicio de Atención Móvil de Urgencia

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ABSTRACT

Objective: analyze the pertinence of calls made by obstetric users of the Mobile Emergency Care Service (SAMU 192) of Botucatu-SP. **Method:** retrospective and analytical research. All records of prehospital obstetric care delivered by the SAMU 192 in 2012 were analyzed. To be considered responsive, calls should lead to referral to a reference obstetric hospital or be classified with the colors red, orange and yellow, according to risk criteria defined by the Ministry of Health. **Results:** considering the two outcomes evaluated: referral to a reference hospital and risk criteria defined by the Ministry of Health, 6.7% and 75.6% of the calls were not pertinent, respectively. There was no matching between outcomes, neither variation between primiparas and multiparas as regards the call pertinence. **Conclusion:** this study ratifies the need for implementing a risk classification protocol in obstetrics, and support managers in the organization, qualification and effective implementation of the *Rede Cegonha*.

Descriptors: Emergence Medical Services; Emergency Nursing; Prehospital Services; Pregnant Women; Obstetric Nursing.

RESUMO

Objetivo: analisar a pertinência dos chamados realizados pela população obstétrica usuária do Serviço de Atendimento Móvel de Urgência (SAMU 192) de Botucatu-SP. **Método:** estudo retrospectivo e analítico. Analisaram-se todas as fichas de atendimento obstétrico pré-hospitalar realizado em 2012 pelo SAMU 192. Foram considerados pertinentes os chamados que resultaram em encaminhamento ao hospital de referência obstétrica ou aqueles classificados nas cores vermelha, laranja e amarela, segundo critérios de risco propostos pelo Ministério da Saúde. **Resultados:** considerando-se os dois desfechos avaliados: encaminhamento ao hospital de referência e critérios de risco do Ministério da Saúde, não foram pertinentes 6,7% e 75,6% dos chamados, respectivamente. Não houve concordância entre os desfechos, nem variação entre primíparas e multíparas quanto à pertinência do chamado. **Conclusão:** espera-se com este estudo ratificar a necessidade de implementar protocolo de classificação de risco na área obstétrica, bem como subsidiar gestores na organização, qualificação e efetiva implantação da Rede Cegonha.

Descritores: Serviços Médicos de Emergência; Enfermagem em Emergência; Serviços Pré-Hospitalares; Gestantes; Enfermagem Obstétrica.

RESUMEN

Objetivo: Analizar la pertinencia de llamados realizados por la población obstétrica del Servicio de Atención Móvil de Urgencias (SAMU 192) de Botucatu-SP. **Método**: estudio retrospectivo, analítico. Se analizaron todas las fichas de atención obstétrica prehospitalaria del SAMU 192 correspondientes a 2012. Se consideraron pertinentes los llamados que resultaron en derivación al hospital de referencia obstétrico o aquellos clasificados en color rojo, naranja y amarillo, según criterio de riesgos propuesto por el Ministerio de Salud. **Resultados**: considerándose los dos desenlaces evaluados: derivación hospitalaria

y criterios de riesgo del Ministerio de Salud, no fueron pertinentes 6,7% y 75,6% de los llamados, respectivamente. No existió concordancia entre los desenlaces, ni variación entre primerizas y no primerizas respecto de pertinencia de llamados. **Conclusión**: se espera ratificar la necesidad de implementar protocolo de clasificación de riesgo del área obstétrica, y colaborar con los administradores en la organización, calificación y efectiva implantación de la Red Cegonha.
Descriptores: Servicios Médicos de Urgencia; Enfermería de Urgencia; Servicios Prehospitalarios; Enfermería Obstétrica.

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INTRODUCTION

In emergency situations, time and the type of service provided in the aid response are crucial. Hence, mobile emergency prehospital care stands as a possibility for the population to have fast and efficacious access to health care, often at the accident site, thus contributing to improve the user population's health prognosis[1].

In Brazil, the health care network includes the Emergency Medical Regulation Unit and the Mobile Emergency Care Service (SAMU 192), being the latter the care component of the network. It has the objective of getting as fast as possible to the person suffering health problems, by sending ambulances carrying skilled teams[2], in coordination with all the ways of access to the Brazilian Unified Health System (Sistema Único de Saúde or SUS, in Portuguese)[3].

The Regulation Units are staffed with professionals skilled in controlling telephone calls that demand guidance and/or emergency care through the classification and prioritization of emergency care needs, thus regulating an effective flow between referral and counter-referral in the RAS[2].

To provide quick care to people with health problems, the use of resources to meet non-pertinent demands must be identified and avoided. These demands are classified as urgency or emergency cases only because of the population's perception about their health status, but do not fit into the criteria of severity and priority established by the Regulation Units[1].

Non-pertinent demands are a problem to the population and to management. On one hand, there is the time lost by health services, typically by the regulator physician, to regulate a call that is not an urgency or emergency case and, on the other hand, this call may prevent the regulation of pertinent cases because of the services provided to cases that did not need them. This situation may lead to a large number of users with health problems not receiving care in urgency and emergency care services, needing to use their own means to have access to the SUS. Difficult access and health status assessment in risk of death, when evaluated by the population, generate distressing situations[4].

The potential divergences between the population's perception about the situation and the care protocol can lead to conflict between users and the regulator physician, notably because of the different definitions of risk of death and as a consequence of the population's lack of knowledge about how the SAMU 192[4] operates and its nature. These conflicts may happen in all areas, considering that the service must provide care to clinical, surgical, trauma, obstetric, pediatric or psychiatric problems[5].

Considering the specificities and relevance of obstetrics, this field was selected to this study. According to the World Health Organization (WHO), only in 2010 there were about 287,000 maternal deaths in the world. In Brazil, data from the SUS Informatics Department[6], through the Information on Mortality System showed 1,567 maternal deaths in 2013. In that same year, the state of São Paulo reported 219 maternal deaths, of which 75 were in the capital. However, the number of cases can be even higher because of eventual underreporting[7-8].

According to the Ministry of Health[9] maternal death occurs as a consequence of unsuccessful events, non-reception of pregnant and/or puerperal women, lack of family or social support, or even inadequate response by health services. Patients must be properly referred according to their complaints and symptoms, being sent to the proper destination and, this way, not worsening the scenario of obstetric urgency and emergency cases[9].

Diseases or complications that worsen the health of pregnant and puerperal women include infections, previous or current high blood pressure, hemorrhages, heart diseases, severe acute asthma and thromboembolic events, among others. Health professionals from primary to the most complex care services must be prepared to identify risks and provide fast care to these women[9].

In this context, the objective of this study was to analyze calls made by the obstetric population that used the SAMU 192 in Botucatu in 2012 in relation to pertinence, considering the women's parity.

METHOD

This study was submitted to and approved by the Research Ethics Committee of the Medical School of Botucatu.

A retrospective and analytical study was developed in the city of Botucatu, in the state of SP, at the Mobile Emergency Care Service (SAMU 192), where the target population was made up of puerperal and pregnant women, residing in Botucatu and who requested this service between January 01st and December 31st of 2012.

These women were identified according to the nature of occurrence: being a pregnant/puerperal woman, part of the instrument used by the SAMU 192 during all services provided.

This instrument contains the user's identification data (name, address, gender and age); report of the victim's primary evaluation (nature of occurrence and neurological, circulatory and respiratory conditions), vital signals, history of medication use, procedures and medications made by the paramedics, description of the case and team in charge of care. The main researcher of the study gathered the data.

The demand pertinence was classified using two criteria. The first considered the demand as pertinent whenever, after being cared for by the SAMU, the pregnant or puerperal woman was referred to an obstetric reference hospital; whereas the second considered the obstetric risk classification made by the SAMU 192 nurse recommended by the Ministry of Health[7], where the call was considered as pertinent whenever the pregnant woman was classified in red (need for immediate medical care), orange (need for care in up to 15 minutes) or yellow (need for care in up to 30 minutes).

The variables of characterization and those related to the vital data of women that sought the SAMU were as follows: age (years); parity (multipara, primipara); region in the municipality (Center, South, East, West, North); care vehicle (basic support, advanced support, white ambulance); vital signals at the time SAMU arrived at the site: blood pressure (mmHg), heart rate (beats per minute), respiratory rate (respiratory movements per minute) and temperature (°C); blood glucose (mg/dl); oxygen saturation (%); classification in the Glasgow coma scale (3 - 15); victim situation: conscious (yes, no); eupneic (yes, no) and capillary refill time < 2 seconds (yes, no). In addition, the fetal heart rate (beats per minute) was evaluated.

As regards the complaints that gave rise to the call, we investigated the occurrence (yes, no) of uterine contraction, loss of the mucus plug or vaginal content, loss of amniotic liquid, vaginal bleeding, lower abdomen or suprapubic pain, nausea and vomiting, crisis of anxiety or syncope, general malaise (dizziness, weakness, headache), signs or symptoms of urinary tract infection (pain when urinating, micturition urgency and perception of strong urine odor), and other complaints. We also investigated the information recorded by paramedics on the case description field.

The independent variable was the pregnant women's parity (primipara, multipara). Parity-based analyses excluded 4 women due to the lack of this information on the service record; thus, the sample comprised 304 pregnant and puerperal women: 139 primiparas and 165 multiparas.

The outcome studied was pertinent demands classified by the referral by the SAMU team (yes, no) to an obstetric reference hospital and by the risk classification in red, orange or yellow (yes, no). Because of lack of data in some SAMU records, the demand pertinence of five participants could not be classified, resulting in the participation of 299 women in the pertinence analysis.

The SPSS Software version 15.0 was used for data analysis. The number of primiparas and multiparas was compared to the percentage of demands to the SAMU 192 that were not pertinent using the non-parametric Chi-Square test and Wald's test. Kappa's index was used to evaluate the agreement between the two criteria used to characterize the demand pertinence. Significant was set at $p<0.05$ in all cases.

RESULTS

Personal characteristics and those related to calls are presented in Table 1. In 2012, SAMU 192 provided care related to obstetric problems to 358 women. Mean age was 22 years, and most women were multiparas (54.3%), from different regions of the municipality and received care from a basic support unit (76.8%) (Table 1).

Table 1 – Age and parity of women included in the study, region of origin and care vehicle that answered the call to the Mobile Emergency Care Service, Botucatu, São Paulo, Brazil, 2012

Characteristics	n (%)	Total of records*
Mean age in years (minimum - maximum)	22 (14–43)	358
Parity		304
Multipara	165 (54.3)	
Primipara	137 (45.7)	
Region of origin in the municipality		350
Center	77 (22.0)	
South	76 (21.7)	
East	68 (19.4)	
North	67 (19.2)	
West	62 (17.7)	
Care vehicle		358
Basic Support Unit	275 (76.8)	
Advanced Support Unit	77 (21.5)	
White Ambulance	6 (1.7)	

*Note: *Total records filled in the SAMU cards.*

Table 2 shows the maternal vital data and fetal heart rate. Mean values (minimum and maximum) were 90 mmHg (80–220 mmHg) for systolic blood pressure and 50 mmHg (40–90 mmHg) for diastolic blood pressure; 99.0% of women were conscious, 95.3% were eupneic and 99.0% had capillary refill time shorter than two seconds when care was delivered.

Table 3 shows the main complaints of women at the time they called the SAMU. The five main complaints of primiparas and multiparas were, respectively: uterine contraction (41.0% and 34.8%); loss of the mucus plug or vaginal content (15.5% and 13.4%); loss of amniotic liquid (14.3% and 13.4%); vaginal bleeding (132% and 12.3%); and, lower abdomen or suprapubic pain (6.4% and 7.0%). Among primiparas, these complaints accounted for 90.4% of the total, whereas for multiparas these accounted for 80.9% (Table 3).

Following are the complaints grouped as others (Table 3): expelled fetus; fall from own height; delivery at home; fever; diarrhea; dyspareunia; intestinal constipation; car/motorcycle accident; and physical abuse suffered.

The main findings recorded by the SAMU professionals when delivering care are presented in Table 4. The two most frequent findings both among primiparas and multiparas were: cervical dilation from 1 to 4 centimeters, and blood pressure equal to or higher than 140 x 90 mmHg, accounting for 54.1% of the findings recorded among primiparas and 31.1% among multiparas. It is noteworthy that, of the total findings recorded, 8.1% among primiparas and 6.8% among multiparas concerned transportation to an obstetrics reference service upon request by primary care services (Table 4).

Table 2 - Vital data of women included in the study and fetal heart rate, Botucatu, São Paulo, Brazil, 2012

Variables	Mean (minimum - maximum)	n (%)	Total of records*
Systolic blood pressure (mmHg)	90 (80–220)	–	346
Diastolic blood pressure (mmHg)	50 (40–90)	–	346
Heart rate (heartbeats/minute)	90 (56–147)	–	345
Respiratory rate (breathings/minute)	20 (14–60)	–	284
Temperature (oC)	36 (35–39)	–	20
Oxygen saturation (%)	98 (87–100)	–	348
Blood glucose dosing (mg/dl)	98 (72–193)	–	24
Glasgow coma scale	15 (14–15)	–	300
Fetal heart rate (heartbeats/minute)	140 (90–188)	–	243
Conscious	–	299 (99.0)	302
Eupneic	–	283 (95.3)	297
Capillary refill time < 2 seconds	–	199 (99.0)	201

*Note: *Total records filled in the SAMU cards.*

Table 3 – Complaints of women that motivated the call to the Mobile Emergency Care Service, Botucatu, São Paulo, Brazil, 2012

Complaints	Primiparas n (%)	Multiparas n (%)
Uterine contraction	103 (41.0)	99 (34.8)
Loss of the mucus plug / vaginal content	39 (15.5)	38 (13.4)
Loss of amniotic liquid	36 (14.3)	38 (13.4)
Vaginal bleeding	33 (13.2)	35 (12.3)
Low abdomen / suprapubic pain	16 (6.4)	20 (7.0)
Nausea / vomiting	6 (2.4)	5 (1.7)
Crisis of anxiety / syncope	4 (1.6)	13 (4.6)
General malaise (dizziness, weakness and headache)	3 (1.2)	14 (5.0)
Signs and symptoms of urinary tract infection	2 (0.8)	8 (2.8)
Others	9 (3.6)	14 (5.0)
Total*	251 (100.0)	284 (100.0)

*Note: *The same woman could make more than one complaint.*

Table 4 – Main findings recorded by professionals during care provided by the Mobile Emergency Care Service to the study participants, Botucatu, São Paulo, Brazil, 2012

Main findings recorded	Primiparas n (%)	Multiparas n (%)
Cervical dilation of 1 to 4 cm	15 (40.6)	12 (16.2)
Blood pressure ≥ 140×90 mmHg	5 (13.5)	11 (14.9)
Reduced fetal movements	4 (10.8)	8 (10.8)
Cervical dilation of 5 to 8 cm	3 (8.1)	6 (8.1)
Request from basic unit for transfer to the obstetric reference service	3 (8.1)	5 (6.8)
No prenatal	2 (5.4)	9 (12.1)
Cervical dilation of 9 to 10 cm	2 (5.4)	5 (6.8)
Increased fetal movements	2 (5.4)	0 (0.0)
Cessation of prescribed medications	1 (2.7)	4 (5.4)
User of alcohol / other drugs	0 (0.0)	10 (13.5)
Others	0 (0.0)	4 (5.4)
Total	37 (100.0)	74 (100.0)

The analysis on the demand pertinence according to referral to a reference hospital and based on the risk criteria of the Ministry of Health is presented on Table 5. Of the total calls, 20 (6.7%) were considered not-pertinent according to referral to a reference obstetric hospital and, in this case, non-pertinent demands did not vary between primiparas and multiparas: p = 0.3147. Considering the risk classification of the Ministry of Health, 226 calls (75.6%) were considered not pertinent and there was no variation between primiparas and multiparas (p = 0.0707).

When both methods to classify the demand pertinence were compared, they matched in only 91 calls, showing a relevant lack of agreement between classifications (Kappa = 0.04; p = 0.011).

Table 5 – Comparison between primiparas and multiparas, considering the demand pertinence based on referral to a reference hospital and the Ministry of Health risk criteria, Botucatu, São Paulo, Brazil, 2012

Demand	Primiparas		Multiparas		*p* value*
	n	%	n	%	
Referral to a hospital					
Non-pertinent	7	5.1	13	8.0	0.3147
Pertinent	130	94.9	149	92.0	
Ministry of Health risk criteria					
Non-pertinent	111	80.4	115	71.4	0.0707
Pertinent	27	19.6	46	28.6	

*Note: *Chi-square test.*

DISCUSSION

The prevalence of non-pertinent demands to the SAMU found based on the referral to a reference hospital was low and, on the other hand, was high when the risk classification criteria proposed by the Ministry of Health was used. Regardless the criterion used in this classification, there was no significant difference according to parity.

Considering the values found and since the Ministry of Health's classification is based on risk criteria consensually established for pregnant and puerperal women[7], referral to a reference hospital was excessive. Two hypotheses could explain this fact: the first one refers to the potential lack of confidence of the regulating physician and remainder professionals of the SAMU 192 regarding obstetric care, fostering unnecessary referrals. The second is related to the inexistence of an effective health care network in the field of obstetrics in the municipality - the *Rede Cegonha* - leading to poor coordination among services and showing different ways of performing the work at different levels of complexity. Similar aspects have been discussed in a qualitative study developed in 2011 among SAMU 192 physicians and physicians on duty in three public hospitals of Belo Horizonte, in the state of Minas Gerais. Most of the physicians reported frustration and lack of confidence during emergency care, because the health care network was structured based on personal links and was not developed in a linear way, being consistently changed depending on the subjects involved. They argued that lack of sequential order brings intangibility to inter-relations established in the network, resulting in frustration and lack of confidence among professionals[10].

Further studies should be carried out to better understand this reality, also giving voice to pregnant and puerperal women to learn the users' perception about a service like the SAMU.

It is worth mentioning that the overload resulting from unnecessary care services rests not only on the reference hospital, but also on the SAMU itself and, in both cases, may lead to lack of care to situations that really need urgency or emergency care[4].

The mean values for vital data collected show normality in all parameters measured. The estimate of low severity of the call is also shown by the fact that three in every four calls were answered by the basic support unit. The situation found in this study regarding the obstetric field has been identified in other studies about the SAMU that point out low severity in many care responses provided in different areas. In 2011, in the city of Chapecó, in the state of Santa Catarina, obstetric diseases accounted only for 3.7% of the services provided by the life advanced support unit[11]. In Porto Alegre, in the state of Rio Grande do Sul, from January to June 2008, a study on clinical care showed that the basic support unit took care of most (91.8%) of the occurrences[12].

The main complaints that motivated calling the SAMU, regardless parity, were: uterine contraction; loss of the mucus plug or vaginal content; loss of amniotic liquid by vaginal route; vaginal bleeding; and lower abdomen or suprapubic pain. In general, these are situations that could and should be assisted in basic healthcare units. It is noteworthy that Decree 1600, of July 07 2011, defines that the basic healthcare care network is responsible for urgency care as a fixed prehospital component[3].

Many of these are typical complaints during pregnancy and when women seek the health units where they have their prenatal care they could be examined to identify cases with accurate indication of referral to a reference service, reducing the overload of this service and strengthening the health care network. The analysis of several findings recorded by the SAMU professionals confirms the pertinence of care provided in basic care units: cervical dilation of 1 to 4 centimeters; lack of prenatal care; increased fetal movements; and cessation of prescribed medications[3].

The population in general perceive their health status according to their social beliefs and, pregnant and puerperal women when at home experience a strong desire of prompt transportation to the hospital every time they believe to be in labor. This reflects the medicalization of processes related to pregnancy- puerperal cycle[4,13]. Corroborating these data, the main cause of calls to the SAMU, both among primiparas and multiparas, was the presence of uterine contraction, which is a condition for labor.

It is worth mentioning the lack of agreement between the two criteria used to define non-pertinent calls, pointing out the need for better organizing the service in order to prevent the aforementioned unnecessary referral and overload of services involved.

A study carried out in Belo Horizonte, in the state of Minas Gerais, showed that primary healthcare professionals do not recognize their responsibility regarding urgency care at the primary care level for different reasons, including inadequate physical structure to provide emergency care, lack of materials and inputs that are more specific to urgency care, and even lack of skills for working in the field of urgency and emergency care, which could lead to conflicts with the SAMU[14].

The qualification of all means of access to care adjusted to the needs of each case, and the understanding that acute or emergency situations must be cared for in all the SUS gateways are crucial to any health care area[14], including obstetrics.

It is noticeable that calls were equally originated from different regions of the municipality. Scientific literature on the topic shows the opposite: that calls prevail in regions farther from the city center where low-income population typically lives[15-16]. This information, however, must be considered with caution, since the number of inhabitants largely varies among regions; this consideration could not be made in this study.

The use of retrospective data from records made by health professionals is a limitation of this study. Hence, in some situations, it was not possible to classify women regarding parity or even the call pertinence.

CONCLUSION

Regardless the criterion adopted to classify non-pertinent demands, no difference was found regarding parity. Data showed a high percentage of non-pertinent demands among primiparas and multiparas, based on the classification by risk criteria. However, frequency was very low considering only the cases not referred to the hospital as non-pertinent demands.

The disagreement between the ways of classifying non-pertinent demands shows excessive cases of referral to reference services, probably unnecessarily. Therefore, the results of this study are expected to ratify the need for implementing the risk classification protocol proposed by the Ministry of Health to the field of obstetrics, and support managers in the organization, qualification and effective implementation of the *Rede Cegonha* in the city.

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