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Original article

Observational Study of the Percentage of Caesarean Sections According to Robson's Classification in the Departmental Hospital of Huancavelica – Peru during 2019

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Abstract *- The objective of this study is to determine the rateof cesarean sections according to Robson's classification. MATERIAL AND METHOD: Observational, retrospective cross-sectional research, at a descriptive level, in 928 deliveries attendedduring the year 2019 at the Departmental Hospital of Huancavelica. The technique was documentary analysis, and the data collection from the Clinical History was used. The analysis of the results was carried out based on Robson's classification and descriptive statistics. RESULTS: The 928 deliveries were distributed in greater proportion in the groups: 1: 30%, 3: 25%, 2: 12%, 5: 10%, 10: 10% of Robson; the proportion of cesarean sections in adolescents was 53.1% (93/175), between 20 and 34 years old 52.1% (325/624) and between 35 and 49 years old 61.2%(79/129); among women residing in urban areas 49.2% and rural areas 59%. The overall cesarean section rate was 53.8%. The proportion of cesarean sections in each Robson group was: 1: 39%,2: 84.2%, 3: 20%, 4: 85.7%, 5: 80.4%, 6: 100%, 7: 100%, 8: 88.2%, 9: 100%, 10: 72.2%. The groups that contributed the most to theoverall absolute and relative rate of cesarean section were groups: 1: 11.6% and 21.6%; 2: 10.3% and 19.3%; 5: 58.4% and 15.6%, 10: 7.0% and 13.0%. Conclusion: The cesarean section rate in the hospital is high, but it is possible to reduce it since a large number of births were located in Robson's group 1, which very rarely requires the operation.*

Keywords *- Caesarean section, Robson classification, Cesarean section rate.*

1. Introduction

The physiological delivery route is vaginal; however, it is often necessary to resolve complications through a cesarean section, which should not exceed 15% of total births; However, as the years go by, it increased, by 2015 worldwide, it has doubled in reference to the year 2000 from 12.1% to 21.1% [1], exceedingthe values recommended by the World Health Organization (WHO), who indicates that cesarean section is essential to improve maternal-perinatal outcomes and prevent maternal andneonatal morbidity and mortality, it has been shown that increasing the rate above the recommended values does not fulfill this purpose, rather it becomes a risk factor [2]. An uneven distribution is observed, with very low proportions in Africa (7.3%) and the highest in South America (42.9%) [3]. Atthe level of Peru, the Demographic and Family Health Survey (ENDES) carried out in 2021 shows an increase of 13.4% between 2011 (22.9%) to 2021 (36.3%). The region with the most cesarean sections is Arequipa, with 45.8 %, and Huancavelica is in penultimate place with 19.8% [4]. With the aim that cesarean section is intended for those who require it, the WHO has proposed the use of the Robson classification system since 2001, which presents 10 groups thatinclude all pregnant women in one of them to evaluate, monitorand compare Caesarean section rates [2], it is a tool that allows standardized analysis between institutions, countries and pointsin time [5], which has a guide provided by the WHO and PAHOtranslated into Spanish [6].

In most studies that analyze the cesarean section rate with Robson's classification, they find it highest in group 4, which considers multiparous women without a previous uterine scar, with a single pregnancy with the cephalic presentation, >37 weeksof gestation in which either labor has been induced or a scheduled cesarean section has been performed and group 5 which considers multiparous women with at least one previous uterine scar, with a single pregnancy with cephalic presentation >37 weeks of pregnancy; in this sense, the recommendation is to avoid medically unnecessary primary cesarean section and do a better analysis of cases that require induction [1], [3], [5], [6]. In Peru, the study following Robson's classification, a study carried out in Tacna from 2000 to 2018, found a global cesareansection rate of 38.6%, which an increase can be seen in the last 19 years and were groups 1, 3 and 5 with a

greater absoluteand relative contribution and in groups 1 and 3 they had a higherrisk of neonatal mortality than those born by vaginal delivery [7]. Subjective indications such as non-reassuring fetal status andnon-progression disorders of labor have been reported to increase the cesarean section rate compared to objective indications [8], [9].

Likewise, there is no information on the application of the classification model at the local level. Added to the above, the research is justified because it is part of the current reality in Latin America, this region of the world being the one with the highest averages of cesarean deliveries [10].

2. State of Art

Gallo, et al. [11]. In the research "Application of the Robson classification model in the practice of cesarean section" Argentina. Its objective was to characterize and group patients undergoing cesarean section according to the Robson Classification Model, as well as determine their main indications and associated clinical-epidemiological characteristics from January 1 to June 30, 2019, a retrospective, descriptive and cross-sectional study. They found the distribution of cesarean sections by age: 6.9% in adolescents, 60.9% from 19 to 30 yearsold and 33.0% in women over 30 years old. The total number of cesarean sections during the study period was 959, and accordingto the Robson classification model, they found that the group that mainly contributed to the total number of cesarean sections wasGroup 5 with 43.7%, followed by Group 1 with 14.7%, and group 10 with 13.6%.

Strambi et al. [12]. In the research "Non-Clinical Variables Influencing Cesarean Section Rate According to Robson Classification" in Italy, he aimed to evaluate the association between cesarean section rates and clinical and non-clinical variables, applying the Robson classification system. In this observational and retrospective study, their sample was made up of 18,079 patients treated between 2012 and 2017. They found that 69.2% were vaginal deliveries and 30.8% were cesarean sections, of which 16.7% were non-elective cesarean sections and 14.1% were elective cesarean sections. Regarding the distribution of cesarean sections by Robson class, class 5 was the most frequent (23.4%), followed by class 2B with 16.8%.

Knobel et al. [13] research "Caesarean Section Rates in Brazil: Trend Analysis Using the Robson Classification System,"aimed to obtain cesarean section rates according to the RobsonGroup Classification in five different regions of Brazil, a descriptive study where they collected data from January 1, 2014to December 31, 2016. They found that the overall cesarean section rate was 56%, of which the highest rates were found ingroup 9 (97.0%). 6 (89.5%), 5 (85.7%), 7 (85.2%) and 8 82.8%. They concluded that more than half of the births in Brazil were cesarean sections. Parveen et al. [14]. In the research "Analysis of Caesarean Sections using Robson's Ten Group Classification System," Pakistan. It aimed to analyze the trends of cesarean sections andevaluate them according to the Robson Ten Group Classification System, a cross-sectional study that was conducted from October 2019 to March 2020. They found that the average age was 26.53 ± 5.1 years, the gestational age was between 37-42 weeks, and 64.7% had a history of cesarean section. Regarding Robson's classification, they found 50.9% turned out to be group 10, 14.4% were group 5, 11.4% were group 1, 6.6% were group 2 and 3, 3% in group 7, 2.4% in Groups 4 and 6, and finally 1.2% in Groups 8 and 9.

Alsulami, et al [15]. In the research "The Rates of Caesarean Section Deliveries According to Robson Classification System During the Year of 2018 Among Patients in King Abdul-Aziz Medical City, Jeddah, Saudi Arabia," aimed to evaluate increasing cesarean section rates by implementing Robson (TGCS) in all cesarean births; an observational and cross-sectional study, where the sample consisted of 3168 births. Theyfound that 67.3% gave birth vaginally, 27.5% gave birth by cesarean section, and 5.3% were instrumental deliveries by vacuum or forceps. Likewise, according to Robson's classification, they found that: 8.2% were classified in Class 1; 13% in class 2 (11.6% in 2A and 1.4% in 2B); 9.2% in class 3; 7.5% in Class 4 (5.5% in 4A and 2%); 36.2% in Class 5 (17.5% in 5.1 and 18.7% in 5.2), 4.7% in class 6; 8.7% in class 7; 3.1% in class 8 have, 0.6% in class 9, and finally, 7.9% in class 10.

Abdo et al. [16]. In the article "Caesarean Section Rates Analyzed Using Robson's 10-Group Classification System: A Cross-sectional Study at a Tertiary Hospital in Ethiopia", they aimed to evaluate cesarean section rates using the 10-Group Classification System. In this cross-sectional study, their sample consisted of 4,004 women who gave birth at the Hawassa University Referral Hospital between June 2018 and June 2019.They found that the overall cesarean section rate was 32.8%, with the main contributors being: group 1 (nulliparous women with a full-term single pregnancy in spontaneous labor) with 22.9%; group 5 (multiparous women with at least one previous cesarean section) with 21.4% and group 3 (multiparous women without previous cesarean section, with a single pregnancy in spontaneous labor) with 17.3%.

Senanayake, et al [17]. In the article "Implementation of theWHO Manual for Robson Classification: An Example from Sri Lanka Using a Local Database for Developing Quality Improvement Recommendations", he aimed to describe the use of a database on hospital births to analyze cesarean section practices according to the WHO manual for Robson classification, and to develop recommendations to improve thequality of care, an observational study; where their sample consisted of 7,504 women gave birth between July 2015 and June 2017.

They found that the cesarean section rate was 30.0%, with 11.9% of cesarean sections performed before labor, and according to Robson's classification, they found that group 3, with 27.0% and group 1, with 23.1%, were the most represented groups; likewise, the main contributors to the cesarean section rate were group 5 (29 .6%), group 1 (14.0%), group 2 (13.3%) and group 10 (11.5%).

Castañeda [18]. In the thesis titled "Cesarean section rate applying the Robson classification model at the National Maternal Perinatal Institute, during the period from January to December 2015", she aimed to determine which Robson group or category. They found that the cesarean section rate was 44.3%, of which the groups that contributed the most to the cesarean section rate were Group 1 at 29.2%, Group 5 at 21.3%, and Group 3 at 14.6%.

3. Conceptual Basis

3.1. Cesarean Birth

Caesarean section delivery is a surgical procedure that involves an incision in the lower abdomen to expose the uterus and a second incision in the uterus to allow the removal of the baby and placenta. Caesarean section can be performed upon identification of problems that arise during or before labor thatmay put the health of the mother or fetus at risk [19]. Globally, the cesarean section rate is increasing in both high- and low-income countries. Recently, governments and doctors have expressed concern about the increase in the number of cesarean births and the potential negative consequences for maternal and child health.

The increase has two main reasons: maternal preference and an increase in emergency cesarean sections attributed to advanced intrapartum fetal monitoring [10], [20]. On the other hand, there are two types of anesthesia for cesarean sections: regional (spinal anesthesia, epidural anesthesia and combined spinal-epidural anesthesia) and general anesthesia.

Current evidence highlights the benefits and greateruse of regional anesthesia over general anesthesia for cesarean section since regional anesthesia avoids the risk of difficult intubation, pulmonary aspiration of gastric contents, minimal blood loss and helps avoid the use of multiple drugs that can cause drug-drug interactions [21].

3.2. Types of Cesarean Section

3.2.1. According to Obstetric History

- First: This is when the procedure is performed for the first time in a pregnant woman [22].
- Previous: this is when there is a history that the procedure has already been performed once [22].
- Iterative: this is when there is a history of the procedure being performed two or more times [22].

3.2.2. According to Indications

- Urgent: It is one that is performed as a consequence of a serious acute pathology of the mother or fetus, with maternal-fetal life-threatening risk or fetal neurological prognosis, which makes it advisable to terminate the pregnancy quickly [23–26].

Indications:
- Suspicion/loss of fetal well-being.
- DPPNI.
- Cord prolapse.
- Uterine rupture.
- Amniotic fluid embolism.

- Caesarean section in the course of labor: It is indicated andperformed during the course of labor for different problems, generally due to dystocia. The indication must be clearly stated in the CH, the patient must be informed and the informed consent must be signed [23–26].

Indications
- Failure of induction: an induction will be considered failed when, after 12 hours of oxytocin v, established birth conditions have not been reached (cervix effaced by 50%, dilated 2-3 cm, with active uterine dynamics) [23].
- Vaginal delivery: labor will be considered to be vaginal delivery when, having established active labor conditions, more than 3 hours have passed without progression of obstetric conditions (dilation or effacement) [23], [24].
- Cephalopelvic disproportion: it will be diagnosed when, in a situation of complete dilation, active dynamics and active pushing, the presentation guide point does not reach the third plane after a period of time.
- Malpositions detected during labor: forehead/bregma [25], [26].

- Elective: It is what is scheduled to be carried out on a specific date for some medical indication and is carried out before labor begins. Elective cesarean sections should be scheduled from 39 weeks of gestation to reduce the risk of fetal morbidity [26–28].

Indications:
- Breech, transverse or oblique presentation: an external cephalic version will always be offered at 36weeks [26], [29], [30].
- Placenta previa: The placenta previa occurs when it is located very close to the cervix, totally or partially obstructing its opening [26], [29].
- Maternal infections: pregnant women carrying condylomata acuminata that extensively affect the soft canal. HIV+ patients [24], [27].
- Iterative cesarean section: ≥ 2 previous cesarean sections [31], [32].
- Previous cesarean section with vertical or classic corporal uterine incision or extended transverse "T" hysterotomy: risk of uterine rupture [26], [31].
- Fetal compromise that contraindicates FHR induction-monitoring of labor: fetal malformations, Doppler abnormalities, fetal arrhythmias [26], [29].
- Maternal medical pathology that advises against vaginal delivery: heart disease, stroke risk [26], [29].
- In some cases of prematurity, fetal macrostomia and multiple gestations, it will depend on the individual circumstances of each case, and action will be taken according to specific protocols [26], [29].

3.2.3. According to Surgical Technique

- Corporal or classic: The vertical incision is made in the uterine body near the fundus. Its most frequent

indications are invasive cervical cancer, preterm pregnancy, transverse fetal position with lower back, prior corporal hysterorrhaphy, placenta previa on the anterior side and postmortem cesarean section. The disadvantages of this incision are more difficult opening and closing, greater bleeding and adhesions, and less resistant hysterorrhaphy that can become dehiscent during a new pregnancy [22].

- Body segment (Beck): The incision is vertical and is made on the segment and part of the uterine body. Its main indications are preterm pregnancy, twin pregnancy, transverse fetal position with lower dorsum, pelvic presentation, placenta previa on the anterior surface of the uterus, retraction ring and previous body hysterorrhaphies. The disadvantages of this technique do not differ from the previous one [22].
- Arc-shaped or transverse segment: It is the most used surgical technique due to its multiple advantages. When a transverse incision is made in the lower segment, it has the advantages of producing less bleeding, allowing easy opening and closing of the uterine wall, formation of a very resistant uterine scar with little probability of dehiscence and rupture in subsequent pregnancies, and few postoperative adhesions [22].

3.2.4. Cesarean Section Complications

A cesarean section is a surgical procedure that can lead to numerous complications for both mother and child. A WHO study on adverse maternal and fetal outcomes between 2004 and 2008 in 24 countries showed that caesarean sections are associated with increased risks for mother and child and that, therefore, a caesarean section should only be performed when clear advantages [33].

Complications of cesarean section can occur intraoperativelyand postoperatively.

- Intraoperative: These complications can occur in the mother, the fetus or both.
  - Maternal: uterine hypotonia or atony, hemorrhage, lesions of the small or large intestine, bladder, as well as amniotic fluid thromboembolism and prolongation of hysterorrhaphy that can tear or lacerate the uterine arteries. Anaesthesia can cause complications in the mother that can be respiratory: hypoventilation, respiratory depression, laryngeal edema, bronchoaspiration, bronchoconstriction, respiratory arrest, massive absorption of anesthesia, and cardiovascular: hypertension, tachycardia, bradycardia, arrhythmia, heart failure and cardiac arrest [34–37].
  - Fetal: trauma, aspiration, respiratory depression [28], [36], [37].

- Postoperative:
  - Maternal: Direct (uterine hypotonia, hemorrhages, hematomas, injuries to the bladder, ureter, intestine and paralytic ileum), indirect (puerperal and urinary infection, anaemia, hemorrhage due to retention of placental remains, dehiscence of hysterorrhaphy among others), tardy (uterine rupture in subsequent pregnancies and adhesion processes) [38].
  - Neonatal: Transient tachypnea of the newborn and pulmonary adaptation syndrome [28], [38].

3.2.5. Robson Classification of Cesarean

Robson's system classifies all births into one of ten groups based on five parameters: obstetric history (parity and previous cesarean section), the onset of labor (spontaneous, induced, or elective cesarean section before the onset of labor), fetal presentation (cephalic, breech or transverse), number of newborns and gestational age (preterm or term) [39]. Robson's ten categories can be applied prospectively, as eachwoman admitted for delivery can be immediately classified onthe basis of some variables that are usually routinely recorded [39]. Robson's classification has been used to analyze trends and determinants of cesarean section use in health facilities in high-and low-income countries. It has also been applied to state, national and international data sets since this system helps monitor and audit specific institutions and offers a standardized comparison method between institutions, countries and points intime [5].

Analyzing the cesarean section rate according to Robson's classification allows us to standardize the analysis worldwide, objectively, since we have defined parameters and a guide provided by the WHO and PAHO [41].

3.2.6. Definition of Terms

Robson classification system: It is a reproducible, clinically relevant and prospective system proposed by the World HealthOrganization (WHO) as a global standard to evaluate, monitor and compare cesarean section rates; which classifies all births into one of 10 groups based on 5 parameters: obstetric history, the onset of labor, fetal position, number of neonates, and gestational age.

Cesarean section: It is a surgical procedure performed for theextraction of the fetus and ovular annexes when the clinical condition does not allow it to be done vaginally, scheduled, intrapartum or emergency.

Hypothesis: This research does not require a hypothesis.

Variable: Caesarean section rate according to the Robson model.

4. Methodology

4.1. Temporal and Spatial Scope

The Departmental Hospital of Huancavelica has category II –2; the hospital is the only one with the highest category in the region; it is responsible for caring for the most critical conditions that can occur in any of the seven provinces of the region. It hasno assigned population; it is purely referential.

Table 1. Robson classification models [39]

Group	Description
	Included women
Group 1	Nulliparous women with a single pregnancy with the cephalic presentation, >37 weeks of gestation and in spontaneous labor.
Group 2	Nulliparous women with a single pregnancy, with the cephalic presentation, >37 weeks of gestation, in which labor has either been induced or a scheduled cesarean section has been performed. (before labor).
Group 3	Multiparous women without a previous uterine scar, with a single pregnancy with cephalic presentation, >37 weeks of gestation and in spontaneous labor.
Group 4	Multiparous women without a previous uterine scar, with a single pregnancy with cephalic presentation, >37 weeks of gestation in which labor has either been induced or a scheduled cesarean section has been performed (before labor).
Group 5	All multiparous women with at least one previous uterine scar, with a single pregnancy with cephalic presentation, >37 weeks of gestation.
Group 6	All nulliparous women with a single pregnancy with breech presentation.
Group 7	All multiparous women with a breech single pregnancy, including those with previous uterine scarring.
Group 8	All women with multiple pregnancies, including those with previous uterine scarring.
Group 9	All women with a single pregnancy with a transverse or oblique position, including those with previous uterine scarring.
Group 10	All women with a single pregnancy with cephalic presentation, <37 weeks gestation, including those with previous uterine scars.

Table 2. Operationalization of variable

Independent Variable	Conceptual Definition	Operational Definition	Dimensions	Indicators	item	Type of Variable
Caesarean section, according to the Robson model	It is a reproducible, clinically relevant and prospective system proposed by the World Health Organization (WHO) as a global standard to evaluate, monitor and compare cesarean section rates [44].	It is the proportion of cesarean sections identified in each of the 10 Robson groups based on five obstetric parameters.	General characteristics	Completed years of the pregnant woman	Age at time of last birth.	Numeric
				Place where she lives	Origin: Urban (1) Rural (2)	Nominal
			Obstetric characteristics	Number of fetuses, number of pregnancies	Type of pregnancy: Single (1) Multiple (2)	Nominal
				Part of the fetus that is presented to the pelvis	Presentation and situation: Cephac (1) Podalic (2) Transverse (3) Oblique (4)	Nominal
				Number of births	Obstetric history: Nulliparous (1) Multiparous (2)	Nominal
				Type of delivery	Vaginal, cesarean section	Nominal
				Number of weeks since last menstrual period	Gestational age: Term ≥37ss (1) preterm < 37ss (2)	Nominal
				Number of previous cesarean sections	Previous cesarean section: Yes (1) No (2)	Nominal
				Way of starting labor	Start of labor: Spontaneous (1) Induced (2) No labor (scheduled cesarean section, prior to labor) (3)	Nominal
			Robson classification	Number of cesarean sections per group	Group to which the patient belongs and the route by which the last birth concluded	Ordinal

The births that occurred in 2019 were evaluated, with the aimof safeguarding the quality of the records, in addition to evaluating the natural flow of patients, which in the last two years were altered due to the strategies taken against the pandemic.

4.2. Kind of Investigation

The research is descriptive, observational, retrospective andcross-sectional [40], [42].

4.3. Research Level

The level of the research is descriptive [40], [42] since the events will be described using the records managed in the hospital when an obstetric patient is cared for.

4.4. Research Design

The design corresponds to the simple descriptive one.

$$M \rightarrow O$$

Where:

M = Sample: Patients whose birth was attended during 2019.

O = Characteristics of each Robson group.

4.5. Population, Sample and Sampling

- Population: it consisted of 928 deliveries attended at the Huancavelica Departmental Hospital from January to December 2019.
- Sample and sampling: It was made up of the entire population, which is why it is called a census sample.

Exclusion Criteria

- Incomplete medical records.
- Medical records in court.

5. Results

The results are presented, responding in the first instance to the specific objectives and then to the general objective. It should be noted that the study sample consisted of 928 pregnant women at the Departmental Hospital in Huancavelica - Peru. In Table 3, we present that, of the total number of births attended at the Departmental Hospital of Huancavelica, 18.9% were adolescents, 67.2% were between 20 and 34 years old, and 13.9% were between 35 and 49 years old, in this last group of women.

61.2% of births were by cesarean section. 55.6% live in urban areas and 44.4% in rural areas; 59% of women in rural areas ended their birth by cesarean section.

Table IV presents the births according to the characteristics of each Robson group, in which we have group 1: 30% (277); group 3: 25% (235); group 2: 12% (114), group 5: 10% (97); group 10: 10% (90), group 4: 6% (56), while groups 7, 8 and 9represented less than 2% of the total births attended at the HDH in 2019.

The proportion of cesarean sections in each group was given in the following order: 100% was observed in group 6: which is made up of all nulliparous women with breech presentation, group 7: which includes all multiparous women with a single pregnancy in breech presentation, including thosewith previous uterine scars and group 9: which includes all women with a single pregnancy with a transverse or oblique situation, including those with previous uterine scars; followedby group 8: with 88.2% that groups all women with multiple pregnancies, including those with previous uterine scars, group4: with 85.7% that includes multiparous women without a previous uterine scar, with a single pregnancy with cephalic presentation, ≥37 weeks of gestation in which either labor has been induced or a planned cesarean section has been performed (before labor), group 2: with 84.2% involving nulliparous women with a single pregnancy, with cephalic presentation, ≥37 weeks of gestation, in which either labor has been induced or aplanned cesarean section has been performed (before labor), group 5: presents 80.4% of cesarean sections, in multiparous women with at least one previous uterine scar, with a single pregnancy with cephalic presentation, ≥37 weeks of gestation and in group 10: it was 72.2%, in women with a single pregnancy with cephalic presentation, <37 weeks of gestation, including those with previous uterine scars; in group 1: it was 39% in nulliparous women with a single pregnancy with cephalic presentation, ≥37 weeks of gestation and in spontaneous labor, and finally group 3: 20% which includes multiparous women without a previous uterine scar, with a single pregnancy with the cephalic presentation, ≥37 weeks of gestation and in spontaneous labor. The data in this table helps us corroborate the quality of the data classification.

Table 3. Age and origin of the women whose delivery was attended at the departmental hospital of Huancavelica, 2019

Births Characteristics	Vaginal		Caesarean Section		Total	
	n	%	n	%	N=928	%
Age						
13 - 19	82	46.9	93	53.1	175	18.9
20 - 34	299	47.9	325	52.1	624	67.2
35 - 49	50	38.8	79	61.2	129	13.9
Origin						
Urban	262	50.8	254	49.2	516	55.6
Rural	169	41.0	243	59.0	412	44.4

Table 4. Obstetric Characteristics, according to Robson of Women Whose Delivery was at the Departmental Hospital of Huancavelica, According to Type of Delivery 2019

Characteristics of Robson groups	Vaginal		Caesarean section		Total	
	n	%	n	%	N=928	%
nulliparous women, single pregnancy, cephalic presentation, ≥37 weeks of gestation and in spontaneous labor.	169	61.0	108	39.0	277	30
nulliparous women, single pregnancy, cephalic presentation, ≥37 weeks of gestation, induced labor or planned cesarean section (before labor).	18	15.8	96	84.2	114	12
multiparous women without a previous uterine scar, single pregnancy with cephalic presentation, ≥37 weeks of gestation and in spontaneous labor	188	80.0	47	20.0	235	25
multiparous women without previous uterine scar, single pregnancy with cephalic presentation, ≥37 weeks of gestation in which labor has either been induced or a planned cesarean section has been performed (before labor)	8	14.3	48	85.7	56	6
all multiparous women with at least one previous uterine scar, with a single pregnancy with cephalic presentation, ≥37 weeks of gestation	19	19.6	78	80.4	97	10
all nulliparous women, single pregnancy with breech presentation	0	0.0	14	100	14	2
all multiparous women, breech single pregnancy, including those with previous uterine scars	0	0.0	16	100	16	2
all women with multiple pregnancies, including those with previous uterine scars	2	11.8	15	88.2	17	2
all women, single pregnancy with a transverse or oblique position, including those with previous uterine scars.	0	0.0	12	100	12	1
all women, single pregnancy with cephalic presentation, <37 weeks of gestation, including those with previous uterine scars.	25	27.8	65	72.2	90	10
TOTAL	**429**	**46.2**	**499**	**53.8**	**928**	**100**

Table 5. Cesarean section rate, according to Robson in delivery at the Huancavelica departmental hospital, 2019

Robson groups	Cesarean sections	Total number of births (Vaginal - Cesarean section)	Caesarean section rate by group	Absolute contribution to the global Cesarean section rate	Relative contribution to the global cesarean section rate	Cesarean sections
	N	N	(%)1	(%)2	(%)3	n
1	108	277	29.8	39.0	11.6	21.6
2	96	114	12.3	84.2	10.3	19.2
3	47	235	25.3	20.0	5.1	9.4
4	48	56	6.0	85.7	5.2	9.6
5	78	97	10.5	80.4	8.4	15.6
6	14	14	1.5	100.0	1.5	2.8
7	16	16	1.7	100.0	1.7	3.2
8	15	17	1.8	88.2	1.6	3.0
9	12	12	1.3	100.0	1.3	2.4
10	65	90	9.7	72.2	7.0	13.0
Total	**499**	**928**	**100**	**-**	**53.8**	**100.0**

1. % = number of women in the group / Total number of women who have given birth in the health facility x 100
2. % = number of cesarean sections in the group / Total number of women in the group x 100
3. % = number of cesarean sections in the group / Total number of women who have given birth in the health facility x 100
4. % = number of cesarean sections in the group / Total number of cesarean sections in the health facility x 100

In table V, the proportion of cesarean section observed by group:1: 39%, 2: 84.2%, 3: 20%, 4: 85.7%, 5: 80.4%, 6: 100%, 7: 100%, 8: 88.2%, 9: 100%, 10: 72.2%, the groups with the greatest absolute and relative contribution to the overall cesareansection rate were 1,2,5,10, with 11.6% and 21.6%; 10.3% and 19.2%; 8.4% and 15.6%; 7.0% and 13.0%. The overall cesareansection rate at the Huancavelica Departmental Hospital during 2019 was 53.8%.

6. Discussion

Caesarean section is one of the strategies used to extract thefetus from the intrauterine; when vaginal delivery is not possible,the rate should remain between 10 to 15% of total deliveries [2]; however, worldwide Caesarean section rates have increased on average up to 21.1% (2015), it is suspected that cesarean sections are not well distributed and are not reaching the population that requires them. South America has the highestrate, 42.9% [10]. For this reason, it was necessary to evaluate the practice of cesarean section in all health facilities so that itspractice is directed to necessary situations.

At the Departmental Hospital of Huancavelica (HDH), it wasfound that in all age groups, cesarean sections exceed 50%, reaching 61.2% between 35 and 49 years of age. In this age range, pregnant women are more prone to complications. Therefore, a higher proportion of cesarean sections is shown inthis age group. On the other hand, Gallo et al. [11] find in relation to the total number of cesarean sections, 6.9% in adolescents, 60.9% in women from 19 to 30 years old and 33.0% in women over 30 years old. When analyzing by origin, a higherproportion of cesarean sections is found in women from rural areas (59%) compared to those who live in urban areas (49.2%),a situation that is justified by being a reference hospital, understanding that the majority of women from rural areas are referred with one or more complications.

When classifying the deliveries attended into Robson's 10 groups, a greater proportion was observed in groups 1: 30% (277) and 3: 25% (235). These are the groups that must end mostly by vaginal delivery. 100% of groups 6, 7 and 9 ended ina cesarean section. In the case of group 6 groups all nulliparous women with breech presentation; and group 7, multiparous women with a single pregnancy in breech presentation, including those with previous uterine scars; and group 9, women with a single pregnancy in a transverse or oblique situation, including those with previous uterine scars, which means that there is good quality in the data collection andthe cesarean sections were relevant.

The sum of the three groupsconstitutes 5% of the total deliveries; therefore, it would not increase the overall rate of cesarean sections. In groups 2,4,5,8and 10, the proportion of cesarean sections remained above 72%;the groups with the lowest proportion of cesarean sections weregroup 1: 39% with nulliparous women with a single pregnancywith the cephalic presentation, ≥ 37 weeks of gestation and in spontaneous labor, and group 3: 20% which includes multiparous women without a previous uterine scar, with a single pregnancy with the cephalic presentation, ≥37 weeks of gestation and in spontaneous labor [41]. The data collection is of good quality because it complies with the data quality evaluation steps indicated in the application manual, of the Robson classification.

When evaluating the cesarean section rate according to Robson, it is identified that the groups that contributed the mostto the overall absolute and relative cesarean section rate were groups 1: 11.6% and 21.6%; 2: 10.3% and 19.3%, 5: 58.4% and 15.6% and 10: 7.0% and 13.0%When analyzing the cesarean section rate by group (column5), almost in all groups, it exceeds the Robson guidelines; in group1, it should have been 10%; however, it was 39%, 4 times more; group 2, it should be around 20 to 35%, however in the study, it is calculated 84.2%, two times more; Mostly, the increase in cesarean sections in this group is related to the low percentage of success in inductions; in group 3 it should be 3% in the studyit was identified as 20%, in group 4: it should rarely be higher than 15%: however we identified 85.7%, as we can see the difference is 70.7%, in group 5: it is considered appropriate between 50 - 60%, in this group it was 80.4%, this is because some specialists have a policy of using scheduled cesarean section in all women with a history of uterine scar, in group 8: itis around 60%, in this group it was 88.2% and in group 10: it isaround 30%, in our study it was 72.2%.

It is clearly seen that theproportions of cesarean section recommended by Robson in each group were overwhelmingly exceeded, which could not bejustified as being a referential hospital that receives pregnant women with risk factors and complications that are often extreme morbidities. When examining the relative contributionof groups 1,2 and 5, it is found to be 56.4%; the contribution ofgroup 5 to the overall cesarean section rate is low, at 15.6%. This number will always be maintained when we control the cesareansection proportions in groups 1, 2 and 3; it is important to maintain it around the numbers recommended in the Robson guidelines. The low proportion in group 5 suggests that the cesarean section rate in previous years was lower.

The global Caesarean section rate in the HDH was 53.8% during the period of 2019, which is a very high figure in relation to the WHO recommendations (10-15%) compared to other hospitals in Italy, Strambi et al. [12]. Evaluated deliveries from2012 to 2017 in tertiary hospitals, they reported a cesarean section rate of 30.8%, similar to that found by Alsulami et al. [15] in Saudi Arabia. Who reports 27.5%, as well as in Ethiopia, Abdo et al. [16] report 32.8%; almost halfway through our study, another study developed by Knobel et al. [13]. In Brazil, in the period from 2014 to 2016, the cesarean section ratewas reported similar to the present study (56%), while in a levelII hospital in Peru, Castañeda [18] reports 44.3% cesarean section. It is observed that, in South America, the cesarean section rate is high and, therefore, in Peru and Huancavelica. This situation invites us to exhaustively evaluate the indications for cesarean section for each group, which will help us

identifyprocedures that require improvement to lower the cesarean section rate.

7. Conclusion and Future Work

The cesarean section rate remained at 50% in the three age groups, being higher in women between 35 and 49 years old (61.2%), and cesarean section was in a higher proportion (59%) in women from rural areas. The highest proportion of deliveries attended was in group1: 30%, which corresponds to nulliparous women with a single pregnancy with the cephalic presentation, ≥37 weeks of gestation and in spontaneous labor, followed by groups 3: 25%., 2: 12%, 5: 10% and in the group 10: 10% of Robson, which is encouraging, and strategies can be done to reduce the overall high cesarean section rate. The cesarean section rate in the hospital is high at 53.8%; the groups that contributed the most to the overall absolute and relative cesarean section rate were groups 1: 11.6% and 21.6%; 2: 10.3% and 19.3%, 5: 8.4% and 15.6%, 10: 7.0% and 13.0%, because they are above what is recommended for each group.

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