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Epidemio-Clinical Study of Materno-Fetal Complications of Diabetes at CSREF CVI of the Bamako Health District

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Abstract **Original Research Article**

Introduction*:** The **aim** of our study was to study the frequency of maternal and fetal complications of Diabetes in the endocrinology and gyneco-obstetrics department of the Reference Health Center of Commune VI of the Bamako district. ***Methodology: This was a descriptive and analytical study of a prospective nature covering the period from December 1, 2019 to December 31, 2020. ***Results*:** In total we identified 80 cases whose average age was 31 years +/- 5.84 with extremes of 20 and 42 years. They were all married. The risk factors found were familial ATCD (1st degree) in 37.04% of cases, advanced maternal age in 25.93% of cases, obesity/overweight in 22.22% and ATCD of DG in 14.81%. Elsewhere we found 02 or more risk factors in the same patient in 55.56% and macrosomia in 20% of cases. During our study, 71.25% of patients were put on insulin therapy with RHD, 26.25% on RHD alone and 2.5% were on OAD. Delivery was carried out vaginally in 61.25% and 38.75% of patients underwent cesarean section. Maternal complications were dominated by urinary infections and hypoglycemia, respectively 46.15% and 23.08% of cases. Embryonic and fetal complications were dominated by macrosomia and polyhydramnios, respectively 46.53% and 18.60% of cases. Neonatal complications were dominated by hypoglycemia and hypocalcemia in 50% and 16.67%.

Keywords: Diabetes; Gestational Diabetes; Maternal-fetal complications; Prognosis; CS Ref CVI; Bamako.

I. INTRODUCTION

According to the International Diabetes Federation (IDF) [1], diabetes is the first non-infectious epidemic affecting humanity with a global frequency of 537 million (i.e. 1 in 10 people) in 2021, including 61 million in Europe. If this trend continues by 2045, there will be 784 million people with diabetes worldwide.

The figures for Africa, which is home to 4.5% of diabetics in the world, are 24 million in 2021 and 55 million in 2045, an increase of 129 if nothing is done [1].

Diabetes associated with pregnancy is a very high-risk situation due to multiple serious complications that can jeopardize the maternal-fetal prognosis [2].

The association can generate higher risks of perinatal complications and the long-term development of chronic diseases (diabetes, hypertension, cardiovascular disease) in the mother and her child [3, 4]. Adverse pregnancy outcomes caused by diabetes include preeclampsia, cesarean delivery due to macrosomia, influencing morbidity and mortality in the newborn [5]. Macrosomia, affecting approximately 30% of pregnancies with GDM [6], leads to numerous complications such as shoulder dystocia, brachial plexus trauma, respiratory distress of the newborn and maternal morbidity [7-9].

In addition to these proven diabetes known before pregnancy, there are much more frequent comparable conditions (2% of pregnancies) which are discovered during pregnancy by biology. Their primary

manifestations are obstetrical. This is called gestational diabetes (GDM) [10].

In Canada, most women are screened for GDM with a 50g glucose tolerance test between the 24th and 28th weeks of pregnancy. Those with a positive result are advised to undergo induced oral hyperglycemia (OGTT) with a 75g glucose load, considered the diagnostic test [11, 12]. Following a positive result, actions are taken companies, including close monitoring and appropriate treatment. WHO test is more recent development. It differs from the previous one in that it only requires one step: taking 75 grams of glucose, then measuring venous blood sugar at 2 hours: the test is positive (and gestational diabetes proven) for a higher value. at 1.4 grams/liter, without the need for confirmation [2].

However, as the diagnosis is usually made in the third trimester, many pregnancies affected by GDM remain untreated for a long time, leading to severe complications [13, 14]. Early detection through effective screening is therefore essential in order to enable targeted interventions whose benefits in women at risk are well documented [15-16]. Among these interventions, we find health-dietary measures (especially concerning diet and physical exercise) and the taking of medication (insulin and/or oral hypoglycemic agents) depending on the severity of the disease [17]. Early identification of women at risk to enable the implementation of targeted preventive measures could have a significant impact on reducing complications associated with GDM.

In France, 3 to 6% of pregnant women have gestational diabetes, i.e. around 30 to 40,000 women per year and almost double that in the United States of America [2]. In Africa, hyperglycemia during pregnancy affects 1 in 10 births [2].

In Senegal, the frequency of GDM is estimated at 5.63% according to the study carried out in Dakar on 66 cases in 2011 [2].

In Mali, Traoré reported that gestational diabetes represented 13% of diabetes and pregnancy associations, or approximately 0.078% of pregnancies in hospitals [18].

The objective of diabetes treatment is therefore to normalize blood sugar levels and limit glycemic excursions that cause complications [2].

Optimal management of gestational diabetes poses enormous difficulties in Africa due to:

- Lack of staff training and the absence of adequate support structures; - insufficient screening capacity;
- And the significant cost of access to care [18].

This situation can lead to a delay in diagnosis and treatment.

No study had been carried out on the association of diabetes and pregnancy at the CS Ref CVI in the Bamako district. The CS Ref CVI has an endocrinology unit which treats cases of diabetes, including in pregnant women. We therefore initiated this work to study maternal, fetal and neonatal complications linked to diabetes in the endocrinology unit of the CS Ref CVI.

II. METHODOLOGY

Our study took place in the endocrinology unit and in the gyneco-obstetrics department in the CS Ref of the CVI commune of the Bamako district. This was a cross-sectional, descriptive and analytical study which took place over a period of 13 months (from December 1, 2019 to December 31, 2020). It was made up of all diabetic women monitored at the endocrinology unit. All pregnant women with pre-existing diabetes or gestational diabetes who gave their consent for the study were included. Data were collected prospectively on a pre-established individual survey form sent to patients. They were collected from the following materials: CPN log, Diabetes monitoring log,

Delivery register, Operative report register, Neonatal consultation register.

The variables studied were:

Quantitative: Age, Weight, Height, Blood pressure, BMI, BU, Blood sugar, creatinine, Microalbuminuria/24h, Date of discovery of diabetes.

Qualitative: Address, Profession, Physical activity, Level of education, Mode of discovery of diabetes; Familial ATCD, Macrosomia ATCD, Type of diabetes, Monitoring method, Treatment received, Obstetric echo, ECG, Fundus-Eye.

Free and informed consent was obtained from patients before their inclusion in the study. The patient's refusal not to participate in our study did not prevent her treatment and follow-up in the department. The information given by each patient was completely confidential and was not disclosed. The personal information concerning each patient was coded by a number which did not allow her to be identified during the investigation and publication of the study.

Operational definitions:

Macrosomy is defined as a birth weight ≥ 4000 grams or by a birth weight ≥ 90th percentile of a reference curve of the given population [13].

Hydramnios is defined as excess amniotic fluid of more than two liters during the last months of pregnancy according to CNGOF.

Hypoglycemia is the abnormal drop in blood sugar levels, i.e. < 0.70g/l according to the WHO.

Good blood sugar balance in a pregnant woman is defined by fasting blood sugar ≤ 0.90 g/l or random blood sugar ≤ 1.20 g/l.

Poor blood sugar balance in a pregnant woman is defined by fasting blood sugar > 0.90 g/l or random blood sugar > 1.20 g/l.

Advanced maternal age is any woman aged ≥35 years.

Good APGAR is an APGAR ≥ 7/10.

Morbid APGAR is an APGAR ≤ 6/10.

The data were entered on the world software version 2013 and the analysis was carried out on the IBM SPSS static software version 21. The statistical tests used were the Fisher exact test and Chi² (X^2) with the significance threshold P <0.05.

III. RESULT

III. 1. Frequency

Out of a total of 4,696 patients seen in diabetology consultations, 80 cases of diabetes during pregnancy were recorded, representing a hospital frequency of 1.70%. Among these 80 cases, 70 were recorded in the diabetology department (87.5%) and 10 in the gyneco-obstetrics department (12.5%). It was diabetes pre-existing during pregnancy in 66.25% of cases and gestational diabetes in 33.75% of cases. Maternal, feto-adnexal and neonatal complications represented 27.08%, 44.79% and 28.13% respectively.

III.2. Socio-demographic characteristics:

The average age was 31 years +/- 5.84 with extremes of 20 and 42 years. The most represented age group was [25-34] years old.

Housewives were the most numerous with 61.25%.

III.3. Clinical aspects

The reasons for consultation were dominated by pre-gestational diabetes in 66.25% of cases, and gestational diabetes in 33.75.

The majority of our already diabetic patients had a duration of diabetes of less than five years (67.92%) with extremes ranging from 3 months to twelve years. The majority of our patients (70%) were multiparous.

During our study, pregnancy was only planned in 3 of our patients (5.66%). The risk factors for gestational diabetes found in our study were family history of first degree diabetes in 37.04%, advanced maternal age in 25.93%, obesity or overweight pre-existing during pregnancy in 22.22% and 14.81% of our cases had already developed gestational diabetes Among our cases of gestational diabetes, 51.85% had at least 2 risk factors.

In our series the BMI was normal in 65%, obesity/overweight represented 33.75% and 1.25% were thin.

Obstetric history was dominated by macrosomia in 41.07%, cesarean section in 25%, spontaneous abortion in 16.07%, fetal death in utero (MFIU) in 10.71% and prematurity in 7.14 %. (See Table I below).

Table I: Medical-obstetric history of women

Personal history of diabetes	**Effective**	**Percentage %**
Gestational Diabetes	24	30,00
Type 1 Diabetes	10	12,5
Type 2 Diabètes	**28**	**35,00**
None	18	22,5
Total	**80**	**100,00**
Obstetric history		
Macrosomia	**23**	**41,07**
Fetal death in utero	06	10,71
Spontaneous abortions	09	16,07
Premature delivery	04	07,14
Caesarean section	14	25,00
Total	**56**	**100**

The diagnosis of diabetes was made incidentally during prenatal consultations due to risk factors in 47.5% of cases, 38.75% during a medical consultation and 13.75% during systematic screening (See Table II below).

Table II: Mode of discovery of diabetes

How to discover diabetes	Effective	Percentage %
Prenatal assessment	**38**	**47,5**
Medical consultation	31	38,75
Systematic screening	11	13,75
Total	**80**	**100**

III.4. Paraclinical aspects:

Obstetric Ultrasound was normal in 91.25% and pathological in 8.75% of cases. The fundus was normal in 98.75% and pathological in 1.25% of cases. ECG was normal in all our patients.

III.IV. Supported

71.25% of patients were on insulin therapy + Hygieno-Dietary Diet (RHD), 26.25% were put on a hygienic-dietary diet (RHD) alone, and 2.5% patients were followed on oral antidiabetics (OADs) + healthy diet (RHD) for the remainder of their pregnancy because they had consulted for the first time at a very advanced stage of pregnancy with good glycemic balance (See Table III below).

Table III: Treatment received by pregnant women and term of pregnancy

Treatment Received by pregnant women	Effective	Percentage %
RHD only	21	26,25
ADO + RHD	2	02,50
Insulin + RHD	**57**	**71,25**
Total	**80**	**100**
Term of pregnancy		
≤ 24	3	3,75
25 à 34+6 days	2	2,5
35 à 36+6 days	**36**	**45,00**
≥ 37	**39**	**48,75**
Total	**80**	**100,00**

During our study, the majority of our patients had regular monitoring, i.e. 78.75%, and irregular monitoring in 21.25%, with good glycemic balance in 68.75% compared to 31.25% with poor balance. We thus found a relationship between the monitoring method and glycemic balance (P=0.002). Regular monitoring therefore plays an important role in glycemic balance (See Table IV below).

Table IV: Relationship between monitoring mode and glycemic control

Glycemic balance	Tracking mode		Total
	Regular	Irregular	
Good balance	49 (61,25%)	6 (7,5%)	55 (68,75%)
Bad balance	14 (17,5%)	11(13,75%)	25(31,25%)
Total	63 (78,75%)	17 (21,25%)	80 (100%)

Fisher's exact test df=1 P: 0,002 N=80

Delivery takes place after 37 weeks in the majority of our patients (48.75%). In our series it was performed vaginally in 61.25% of cases (See Table III above).

Caesarean section deliveries accounted for 38.75% in our study.

During our study 38.75% of patients underwent cesarean section, of which the indications for cesarean section were dominated by macrosomia in 64.51% of cases. Other indications for cesarean section were PPROM/Scarred uterus, multi-scarred uterus, uterine scars associated with seat presentation; pre-eclampsia, amniotic fluid abnormalities such as severe oligohydramnios and fetal distress in 35.49% of cases (See Table V below).

Table V: Indications for cesarean section

Type of indication	Effective	Percentage %
Macrosomia	**20**	**64,51**
PROM/Scarred uterus	02	06,45
Severe preeclampsia	02	06,45

Type of indication	Effective	Percentage %
Severe oligohydramnios	01	03,23
Multi-scarred uterus	03	09,68
Scar seat/uterus	02	06,45
SFA	01	03,23
Total	**31**	**100,00**

II.V. Maternal-fetal prognosis

Maternal complications were dominated by urinary infection (46.15%) of cases, hypoglycemia (23.08%), pre-eclampsia and parietal suppuration (07.69%) of cases each, Hypertension, immediate postpartum hemorrhage, ketoacidosis and endometritis (3.85%) cases each (See Table VI below).

We did not find a statistically significant relationship between maternal complications and clinical entities of diabetes (P=0.53); nor between maternal complications and glycemic control (P=0.70).

We have not recorded any cases of maternal death.

Table VI: Maternal complications

Maternal complications	During pregnancy	Postpartum	Total	Percentage %
Hypoglycemia	**05**	**01**	**06**	**23,08**
Ketoacidosis	01	00	01	03,85
HT	01	00	01	03,85
Preeclampsia	02	00	02	07,69
Urinary infection	**10**	**02**	**12**	**46,15**
HPPI	00	01	01	03,85
Parietal suppuration	00	02	02	07,69
Endometritis	00	01	01	03,85
Total	**19**	**07**	**26**	**100,00**

*HPPI: Immediate postpartum hemorrhage

Fetal-adnexal complications were dominated by macrosomia (46.51%) of cases, polyhydramnios (18.60%), in utero fetal death (9.30%), abortion, PROM and prematurity 06.98% of cases each) and malformation (4.55% of cases) (See Table VII below).

We did not find a relationship between feto-adnexal complications and clinical entities of diabetes (P=0.96); nor any relationship between feto-adnexal complications and glycemic balance (P=0.67).

Table VII: Fetal complications

Fetal complications	Effective	Percentage %
Macrosomia	**20**	**46,51**
Polyhydramnios	08	18,60
Prematurity	03	6,98
RPM	03	6,98
Malformation	02	4,65
Abortion	03	6,98
Fetal death in utero	**04**	**9,30**
Total	43	100,00

III.VI. Neonatal Prognosis: (*See Table VIII below*)

The APGAR score was good at the 1st minute for the majority of live newborns in 95.89% of cases and good at the 5th minute in 97.26% of cases.

During our investigation, neonatal complications were dominated by neonatal hypoglycemia in 50% of cases, hypocalcemia in 16.67%, respiratory distress in 12.50% of cases, neonatal jaundice and neonatal mortality in 8. .33% of cases each, polycythemia in 04.67% of cases.

During our study we did not find a statistically significant relationship between the occurrence of neonatal complications and maternal glycemic control (P = 0.52).

Infections in the newborn and fetal trauma during delivery (such as brachial plexus injuries and obstetric fractures) were not observed in our study.

We recorded two (2) cases of neonatal death, one of which occurred early in the neonatology unit and one late which occurred a few days after their discharge from the center.

Three cases of prematurity: one of 32 weeks+01 days, one of 33 weeks+05 days and one of 35 weeks, one

of which was delivered vaginally and the other two by cesarean section for severe pre-eclampsia and for PROM/scarred uterus.

Table VIII: Neonatal complications and APGAR score

Neonatal complications	**Effectif**	**Pourcentage (%)**
Hypoglycémia	**12**	**50,00**
Hypocalcémia	04	16,67
Polycythemia	01	4,67
Respiratory distress	03	12,50
Neonatal mortality	**02**	**8,33**
Neonatal jaundice	02	8,33
Total	**24**	**100,00**
	APGAR	
Time	Morbid	Good
1st minute	4,11%	95,89%
5th minute	2,74%	97,26%

IV. DISCUSSION

IV.1. Methodological approaches

We conducted a prospective, descriptive, cross-sectional and analytical study which took place in the endocrinology and gyneco-obstetrics department of the CSREF CIV in the Bamako district. Our work experienced some shortcomings, notably:

- Confinement during the COVID19 pandemic prevents some people from regularly monitoring their diabetes.
- The limited financial means of some patients for carrying out certain additional examinations;
- The absence in the laboratory of the equipment center allowing the performance of the OGTT.

IV.2. Frequency

We recorded out of a total of 4696 patients seen in diabetology consultations, 80 cases of diabetes and pregnancy, i.e. a frequency of 1.70%. It was pre-gestational diabetes in 66.25% and 33.75% of cases of gestational diabetes. The prevalence of diabetes in pregnant women is assessed differently in the literature. It varies between 0.1% and 2% according to Boudhraâ, Mimouni and Lahlou [19-21]. Our result is in agreement with the majority of these authors. However, it is higher than those reported by Drabo A and Traoré A [2, 18] who respectively found 0.75% and 0.56%. This could be explained by the fact that our study took place in an endocrinology department and also the increase in the frequency of diabetes in the general population. Complications were dominated by feto-adnexal, neonatal and maternal complications, respectively 44.79%, 28.13% and 27.08%. Our result is different from that of Drabo A [2] in whom maternal complications were more frequent followed by neonatal and feto-adnexal complications, i.e. 56.06%, 25% and 18.94% respectively.

IV.3. Sociodemographic characteristics:

The age group between 25 and 34 was mainly represented with 66.25%. The average age was estimated at 31 years +/- 5.84 with extremes of 20 and 42 years, contrary to that reported by Traoré A [18] the age group frequently represented was that of 35 years and over, i.e. 55%. Our result is close to that of Drabo A [2] whose majority age group was 20 to 34 years old with a frequency of 55.4% of cases. This result could be explained by the expansion of diabetes in the young population. According to Grimaldi [22], advanced age is a risk factor for gestational diabetes (GDM).

More than half of our patients were housewives, i.e. 61.25%. This result is approximately identical to that of Drabo A [2] who found 52.7%. This result could be explained by the fact that in our society, generally the woman's place remains in the home.

IV.4. Clinical aspects

The reasons for consultation were dominated by pre-gestational diabetes in 66.25% of cases, and gestational diabetes in 33.75. This result is largely different from that of Drabo A [2] whose reasons for consultation were dominated by ANC in 63.5%, diabetes and pregnancy in 18.9% and late menstruation in 8.1%. In a retrospective study conducted by Traoré A [18] in Bamako, 39% of patients consulted for painful uterine contraction, 32% for diabetes and pregnancy, 10% for excessive uterine height and 2% for pre-eclampsia.

The majority of our patients who were already diabetic had a duration of diabetes of less than five years (67.92%) with extremes ranging from three (3) months to twelve (12) years.

Pregnancy planning constitutes an important step in preconception care in cases of diabetes. During our study, pregnancy was only planned in 3 of our patients (5.66%). This result is close to that of a retrospective study carried out on 100 cases at the

National Training and Reproduction Center in Rabat in Morocco (CNFRH), during which only two women consulted preconception [23]. This low rate could be explained either by unwanted pregnancies or ignorance of the risks involved in their pregnancy.

The majority of our patients (70%) were multiparous, a result very close to that of Lahlou H [21] in whom multiparous represented 69.3%. Some authors consider multiparity as a risk factor for gestational diabetes [5, 18]. Our result favorably supports this assertion by the frequency of multiparous women during our survey.

The risk factors for gestational diabetes found in our study were family history of first degree diabetes in 37.04%, advanced maternal age in 25.93%, obesity or overweight pre-existing during pregnancy in 22.22% and 14.81% of our cases had already developed gestational diabetes. Elsewhere we found at least 2 risk factors in the same patient in 51.85%. Our result is different from that of Drabo A [2] who found overweight in 32.4% of cases, familial ATCD of diabetes in 12.2% of cases, gestational diabetes in 21.6% and hypertension in 8.1% of cases.

In our series the BMI was normal in 65%, obesity/overweight represented 33.75% and 1.25% were thin.

Obstetric history was dominated by macrosomia in 41.07%, cesarean section in 25%, spontaneous abortion in 16.07%, MFIU in 10.71% and prematurity in 7.14%. These suggestive signs were also mentioned by Dembélé A [2] who found macrosomia in 30.9%, and fetal death in utero in 10.9% then by Mimouni [20] and Traoré A [18].

The diagnosis of diabetes was made incidentally during prenatal consultations due to risk factors in 47.5% of cases, 38.75% during a medical consultation and 13.75% during systematic screening. Our result is close to that reported by Dembélé A [2] in whom diabetes was discovered during prenatal assessment in 53% of cases, ahead of risk factors in 29% of cases, ahead of asthenia and polyuropathic syndrome. polydipsia in 14% of cases and ketoacidosis in 4% of cases.

IV.5. Supported

71.25% of patients were on insulin therapy + healthy diet (RHD), 26.25% were put on healthy diet (RHD) alone, and 2.5% patients were followed on oral antidiabetics (OADs) + healthy-dietary diet (RHD) for the remainder of their pregnancy because they had consulted for the first time at a very advanced stage of pregnancy with good glycemic balance, this result is similar to that of the study carried out by Mimouni [20] during which 69.6% of women had received insulin, 16.7% had been put on diet alone and 1.4% were on OAD. During our study, the majority of our patients had regular monitoring, i.e. 78.75%, and irregular monitoring in 21.25%, with good glycemic balance in 68.75% compared to 31.25% with poor balance. However, our patients were more regular in their follow-up than those of Drabo A [2] in whom follow-up was irregular in 55.4% of cases with poor glycemic balance in 54% of cases. This can be explained by the quality of information and care given to patients. We thus found a relationship between the monitoring method and glycemic balance (P=0.002). Regular monitoring therefore plays an important role in glycemic balance.

Delivery takes place after 37 weeks in the majority of our patients (48.75%). According to Geronooz [24], delivery in diabetic women should be scheduled between 38 and 39 weeks. In our series, delivery was carried out vaginally in 61.25% of cases. Our result is close to that of Christophe O [25] who reported 67.8% cases of vaginal delivery. This could be explained by the application of new recommendations concerning the management of a pregnancy associated with diabetes.

Caesarean section deliveries accounted for 38.75% in our study. This result is lower than that of Dembélé A [2] who reported a rate of 45.5%. According to Geronooz [24], the cesarean section rate is 60% in diabetic patients compared to 17% in the non-diabetic population.

During our study 38.75% of patients underwent cesarean section, of which the indications for cesarean section were dominated by macrosomia in 64.51% of cases. Other indications for cesarean section were PROM/Scarred uterus, multi-scarred uterus, uterine scars associated with breech presentation; pre-eclampsia, amniotic fluid abnormalities such as severe oligohydramnios and fetal distress in 35.49% of cases. This result is close to that of Dembélé A [2], whose indications for cesarean section were also dominated by macrosomia in 52% of cases and other indications represented 8% of cases. This could be explained by the glycemic imbalances frequently present in some of our patients responsible for reactive hyperinsulinism of the fetus. According to Geronooz [24], the indication for cesarean section is linked to the increased risk of shoulder dystocia in a macrosomic fetus.

IV.6. Maternal-fetal prognosis

The maternal-fetal prognosis depends on several factors, in particular the planning of the pregnancy, compliance with diabetes monitoring and glycemic balance. However, the course of the pregnancy of certain patients was punctuated by maternal-fetal and neonatal complications.

Maternal complications were dominated by urinary infection (46.15%) of cases, hypoglycemia (23.08%), pre-eclampsia and parietal suppuration (07.69%) of cases each, Hypertension, immediate

postpartum hemorrhage, ketoacidosis and endometritis (3.85%) cases each. This result is very similar to that of Dembélé A [2] who also found urinary infection more dominant, i.e. 29.1%, then pre-eclampsia and endometritis in 7.4% of cases.

Each, immediate postpartum hemorrhage and parietal suppuration in 3.6% of cases each. We did not find a statistically significant relationship between maternal complications and clinical entities of diabetes (P=0.53); nor between maternal complications and glycemic control (P=0.70). We have not recorded any cases of maternal death.

Feto-adnexal complications were dominated by macrosomia with (46.51%) cases, polyhydramnios (18.60%), in utero fetal death (9.30%), abortion, PROM and prematurity 06.98% of cases each) and malformation (4.55% of cases). This result is close to that of Dembélé A [2] who found macrosomia in 48.2%, polyhydramnios 29.4% and abortion and MFIU in 17.6% of cases. In a study carried out by the National Center for Training and Human Reproduction (CNFRH) in Rabat, Morocco, the frequency of macrosomia was 36%. It is between 20 and 40% in the literature [23]. The frequency of intrauterine fetal death in France was 3.5% in a series of 435 pregnancies associated with pregestational diabetes [2]. Poor glycemic control, diabetic nephropathy, smoking are risk factors for in utero fetal death [26].

We did not find a relationship between feto-adnexal complications and clinical entities of diabetes (P=0.96); nor any relationship between feto-adnexal complications and glycemic balance (P=0.67).

IV.7. Neonatal prognosis:

The APGAR score was good at the 1st minute for the majority of live newborns in 95.89% of cases and good at the 5th minute in 97.26% of cases. In the study conducted by Drabo A, the APGAR at the 1st minute was greater than 7/10 in the majority of cases and greater than 7/10 in 85.5% of cases at the 5th minute [2].

During our investigations, neonatal complications were dominated by neonatal hypoglycemia in 50% of cases, hypocalcemia in 16.67%, respiratory distress in 12.50% of cases, neonatal jaundice and neonatal mortality in 8. .33% of cases each, polycythemia in 04.67% of cases. This result is different from that of Dembélé A [2] who found macrosomia in 48.2% of cases and the other complications were polycythemia, hypotrophy, respiratory distress in 7.4% of cases each, Neonatal hypoglycemia and neonatal mortality in 3.7% of cases each. This is explained by the consideration of macrosomia by Dembélé A as a neonatal complication. During our study we did not find a statistically significant relationship between the occurrence of neonatal complications and maternal glycemic control (P = 0.52).

Infections in the newborn and fetal trauma during delivery (such as brachial plexus injuries and obstetric fractures) were not observed in our study. The absence of fetal trauma in our study could be explained by the fact that macrosomia was the main indication for cesarean section. This complication would be linked to vaginal delivery of the macrosoma [27]. We recorded two (2) cases of neonatal death, one of which occurred early in the neonatology department and one that occurred late, occurring a few days after their discharge from the center; this could be explained by a lack of monitoring of newborns. born. Careful monitoring of newborns is a predictor of neonatal complications. Three cases of prematurity: one of 32 weeks+01 days, one of 33 weeks+05 days and one of 35 weeks, one of which was delivered vaginally and the other two by cesarean section for severe pre-eclampsia and for PROM/scarred uterus.

V. CONCLUSION

Diabetes constitutes a major public health problem. Indeed, its association with pregnancy makes it a high-risk pregnancy with regard to complications. The data from our study show that, despite the evolution of practices aimed at optimizing the management of patients with pregnancy-associated diabetes, the outcome of their pregnancy remains in a significant number of cases marred by significant morbidity. Regular monitoring and stable glycemic control were protective factors against these complications. These results show that the management of these patients must be done in an active, multidisciplinary and coordinated manner in a care pathway optimized for the patient.

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