
MANAGEMENT OF PREGNANCY IN A UNIVERSITY HOSPITAL: A 6-YEAR STUDY

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In order to evaluate the obstetric care in the Obstetric Clinic of the Gynaecology and Obstetrics Department of University of São Paulo, the authors present a survey of the management of pregnancy during the 6-year period from 1993 to 1998.

The number of deliveries increased during the study by 45% over the 6 years. During this same period the number of fetal deaths was 526 (4.48%), but there was a significant decrease ($p < 0.05$) in the incidence of fetal death. However, there was no concomitant increase in the proportion of pregnant women with prenatal care that could explain this improvement. Incidence of premature labor also decreased considerably.

The authors believe that the increment in the number of deliveries was due mainly to the increasing number of pregnant women referred to our service. The efforts made by the service towards decreasing the time of hospitalization of both newborns in the nursery and the mothers in the hospital made this possible.

Despite the increasing number of deliveries, there was a significant improvement in the management of pregnancy during the period of study. This improvement may be a consequence of the standardization of a protocol of management of pregnancy based on the recent progress in scientific and technological knowledge.

DESCRIPTORS: Pregnancy. Universities. Management.

Management and outcome of pregnancy may vary substantially depending on the type of hospital (urban or rural, tertiary or primary, private or public or university hospital), incidence of associated maternal and fetal diseases, and the socioeconomic situation of the country.

Although recent progress in prenatal care has been enormous, continuous improvements in maternal and fetal health care are needed. Among these improvements to better insure positive pregnancy outcomes is the expansion of the quality of care to socially and economically deprived patients. Unfortunately, these are the majority in our institution.

Stillbirths tend to decline as the quality of care during and throughout

pregnancy improves. With improvements in prenatal care and proper hospitalization some of these deaths are preventable.

With the aim of analyzing the impact of this recent progress, the authors present an audit of the management and outcome of pregnancy in our service.

MATERIAL AND METHODS

This retrospective study was conducted at the Obstetrics and

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Gynaecology Department of the University of São Paulo School of Medicine, Brazil during the 6 years from January 1, 1993 through December 31, 1998. All patients were from the Hospital das Clínicas, which is a university hospital and a tertiary hospital; the majority of these patients were from the most socially and economically deprived segment of our population. Maternal charts of all deliveries were retrospectively reviewed in order to analyze maternal age, fetal sex, type of delivery, type of presentation, presence of prenatal care, incidence of multiple pregnancy, occurrence of premature labor, incidence of fetal death, and frequency of low and very low birth weight. During this time, 11 442 pregnant women came to our service for

obstetric care with a total of 11 733 deliveries.

Adolescent pregnancy was defined as maternal age equal to or less than 19 years, whereas elderly pregnancy was defined as maternal age 35 years and over. Premature labor was defined as labor before the 37th week of gestation according to the World Health Organization, and postdate pregnancy was defined as labor beyond the 42nd week of pregnancy. We defined fetal death as the delivery of any deceased conceptus weighing more than 500 g. Low birth weight was defined as weight lower than 2500 g, very low birth weight was defined as weight under 1500 g, and extremely low birth weight was defined as a weight less than 1000 g. Fetal macrosomia was defined as a birth weight of more than 4000 g.

Infants were classified as small for gestational age, defined as birth weight below the tenth percentile, or big for gestational age, defined as birth weight above the ninetieth percentile. These percentiles were based on the data from Ramos¹. The percentile values were calculated from the data from our service, and they are applicable in the city of São Paulo.

Numbers were expressed as mean \pm SD. Categorical data were compared with chi-square test, and continuous data were compared with Student *t* test. *P* < 0.05 was considered statistically significant.

RESULTS

The number of deliveries increased during the years of this study. In 1993 the total number of deliveries was 1650. In the last year, the total number of the deliveries was 2396. This represents an increase of 45% in 6 years (Fig. 1). There were 2983 women (25.6%) who did not receive any kind of obstetric care or evaluation during gestation until delivery. During the study, there was no

significant changes in this parameter (Fig. 2). There were 5982 male infants and 5697 female infants. Fifty four infants were of indefinite sex.

During this study the number of fetal deaths was 526 (4.48%). There was a significant decrease in the incidence of fetal death during this 6-year period (Fig. 3).

MATERNAL AGE

The mean age of pregnant women in this study was 27.01 \pm 6.7 years. The youngest woman was 10 years old and the oldest 57 years old. There were 1610 pregnancies among adolescent mothers or 13.9% of the total. On the other hand, 1722 women were 35 years

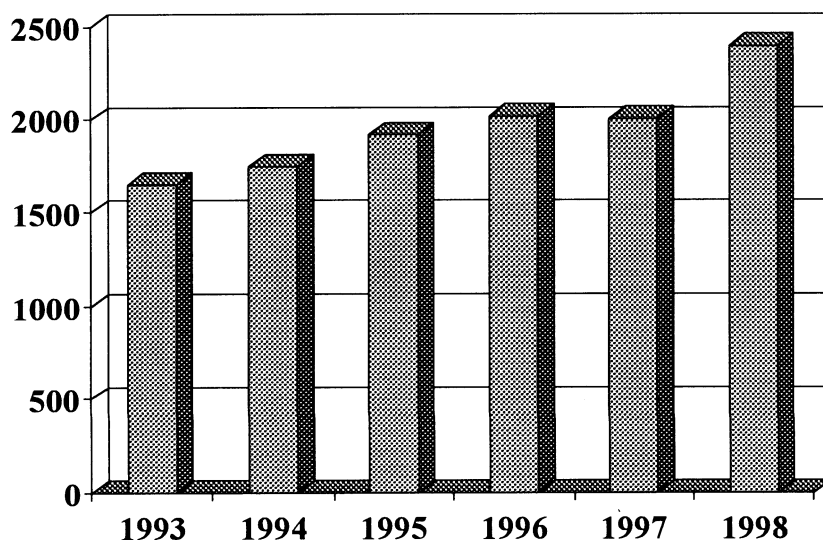


Figure 1 - Evolution of numbers of deliveries through the study.

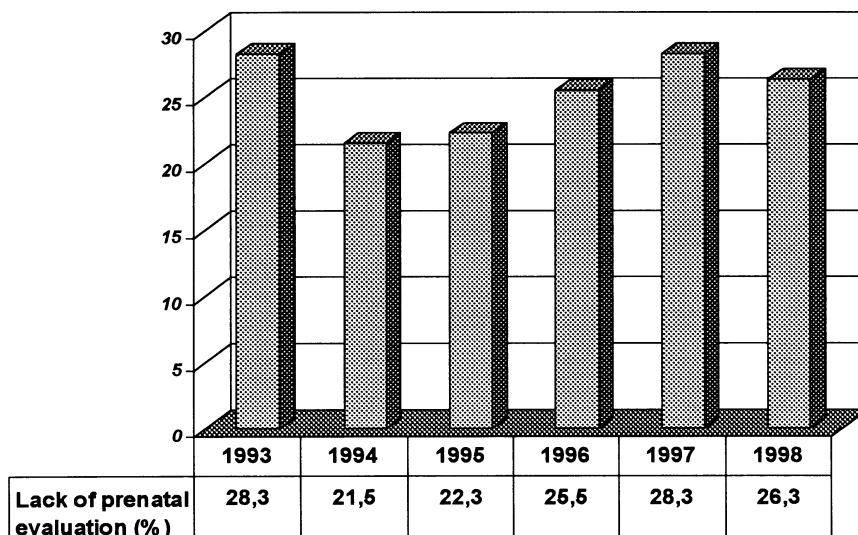


Figure 2 - Proportion of pregnant women without prenatal evaluation during the years study. There was no significant (*p*>0.05) difference between the proportion through the years.

old and over (14.8%). Of these, 467 or 4% were 40 years old and over.

Adolescent mothers presented the highest rate (33.7%) of non-assisted pregnancies, which was significantly higher ($p < 0.05$) than the rate for the 20–34 year-old group (25.4%). The incidence of non-assisted pregnancy was 17.9% among the 35 year-old and over group, and it was 14.9% for the 40 year-old and over group. These incidences were significantly lower than that for the 20–34 year-old group ($p < 0.05$).

The frequency of fetal death was 5.5% among adolescent mothers and 4.1% among mothers 35 years old and over. There were no statistical differences between the incidences of fetal death among elderly mothers when compared to the group of pregnant women between 20 and 34 years old. However, the rate of fetal death among adolescent mothers was significantly higher ($p < 0.0001$) when compared to the group of pregnant women between 20 and 34 years old (3.2%).

GESTATIONAL AGE

The mean gestational age was 37.3 \pm 4.9 weeks. Premature labor was present in 3275 pregnant women, representing 28.1% of the total deliveries. The incidence of premature labor was 29.6% in 1993 and 26.2% in 1998, representing a significant drop in the incidence of premature labor during this study ($p < 0.02$).

Postdate pregnancy was present in 116 women, representing 1.0% of all deliveries. There were no significant changes in the incidence of postdate pregnancy. The proportion of deliveries according to the gestational age is shown in figure 4.

MULTIFETAL PREGNANCY

There were 274 multifetal pregnancies (2.4%) and 11 168 singleton preg-

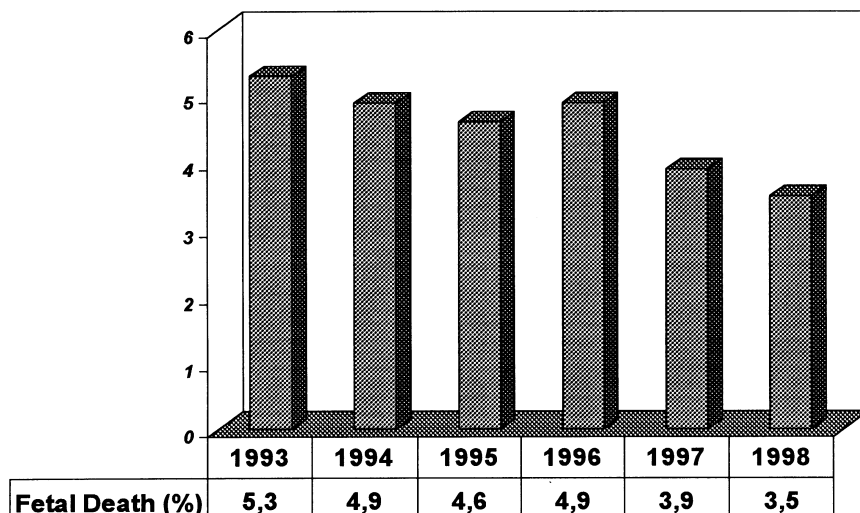


Figure 3 - Fetal death rate during the study. Note that there was a significant ($p < 0.05$) drop in the fetal death rate.

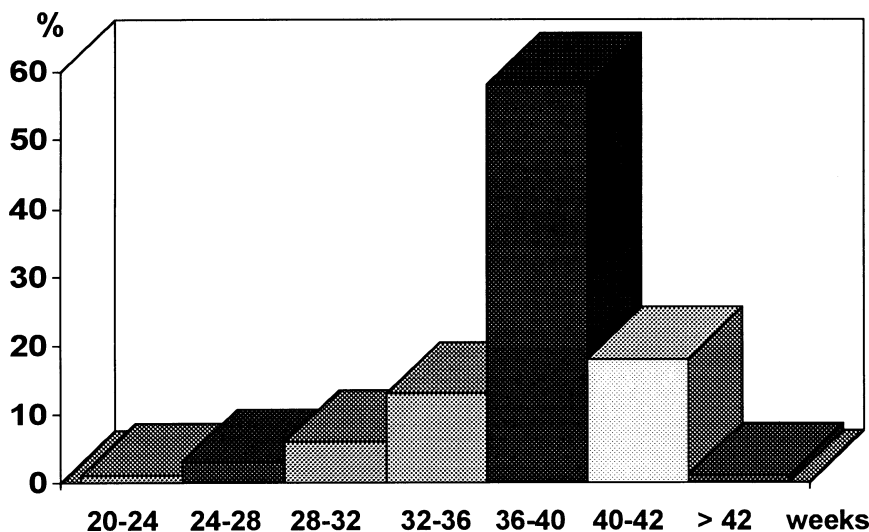


Figure 4 - Proportion of deliveries according to the gestational age.

nancies (97.6%). From these multifetal pregnancies, there were 258 twins, 15 triplets and 1 set of quadruplets. As shown in the table 1, the average duration of gestation and the average birth weight decreased dramatically as the number of fetuses increased.

As shown in the table 2, the average maternal age increased with the number of fetuses. No differences in sex ratio were observed.

There were 40 fetal deaths among multifetal pregnancies. This incidence

was significantly higher than in singleton pregnancies. The distribution of fetal death is shown in table 3.

BIRTH WEIGHT

While 8228 fetuses presented normal weight (2500 to 4000 g) at birth, 2130 fetuses presented weight between 1500 and 2500 g (low birth weight), 534 fetuses presented weight between 1000 and 1500 g (very low birth

weight), and 401 fetuses presented weight under 1000 g (extremely low birth weight). 361 fetuses were macrosomic. There were no available data in 79 charts. The corresponding average gestational age of each group of fetuses is shown in table 4. There was no statistical difference in birth weights between adolescent mothers, elderly mothers, and mothers between 20 and 34 years old.

Table 5 summarizes the correlation between birth weight and gestational age, dividing infants into 3 groups—normal, small, and big for gestational age as defined according to the percentile curves.

TYPE OF DELIVERY

The total proportion of cesarean sections was 53.8%, while 46.8% of deliveries were vaginal, with or without instrumentation. The proportion of cesarean sections increased during the study, but this difference was not significant ($p > 0.05$). Meanwhile, the proportion of vaginal deliveries without forceps increased significantly ($p < 0.01$) and the proportion of forceps deliveries decreased significantly ($p < 0.01$) (Table 6 and Fig. 5).

As shown in the table 7, the proportion of cesarean sections increased as the number of fetuses increased.

In the majority of pregnancies, the type of presentation was cephalic (91.2%). The proportion of pelvic presentations was 8.5%, and only 0.3% had a transverse presentation (Table 8).

DISCUSSION

The present study showed a notable increase in the number of deliveries in our institution over the 6-year study period. This increment in the number of deliveries was mainly due to the increasing number of pregnant women referred to our service. The efforts

Table 1 - Average length of gestation and birth weight for pregnancies with known time of ovulation and 20 or more weeks gestation.

No. of fetuses	No. of pregnancies	Weeks of gestation**	Birth weight (g)**
Singleton	11,063*	37.7 ±± 3.5	2868 ±± 771
Twins	258	35.3 ±± 3.9	2176 ±± 680
Triples	15	34.2 ±± 2.6	1864 ±± 508
Quadruplets	1	31	1203 ±± 88

* - In 105 pregnant women with singleton pregnancy, the time of ovulation was not known or it was less than 20 weeks.

** - $p < 0.01$

Table 2 - Average maternal age and sex ratio for pregnancies with known time of ovulation and 20 or more weeks gestation.

No. of fetuses	No. of pregnancies	Sex ratio M:F	Maternal age
Singleton	11,063*	1.05:1	26.9 ±± 6.7
Twins	258	1:1	28.4 ±± 6.4
Triples	15	1.37:1	28.9 ±± 6.0
Quadruplets	1	0:1	17

* - In 105 pregnant women with singleton pregnancy, the time of ovulation was not known or it was less than 20 weeks.

Table 3 - Distribution of fetal death in multifetal pregnancy.

No. of fetuses	No. of pregnancies	Fetal deaths	Death of pair of twins
Twins	258	36	9
Triples	15	4	1*
Quadruplets	1	0	0

* - Death of two out of a triplet

Table 4 - Average length of gestation according to the birth weight.

Birth weight	No. of pregnancies	%	Weeks of gestation
Macrosomic	361	3.1	39.6 ±± 3.3
Normal	8228	70.1	38.7 ±± 3.8
Low birth weight	2130	18.1	35.1 ±± 4.6
Very low birth weight	534	4.6	30.8 ±± 3.6
Extremely low birth weight	401	3.4	26.9 ±± 4.3
Unknown	79	0.7	
Total	11,733	100	

Table 5 - Distribution of deliveries according to birth weight and gestational age.

Birth weight	No. of pregnancies	%
Small for gestational age	1414	12.3
Big for gestational age	966	8.4
Normal	9153	79.3
Total	11,533*	100

* - In 200 pregnant women, the time of gestation was not known or it was less than 20 weeks or the birth weight was not known.

made by the service towards decreasing the time of hospitalization of both newborn in the nursery, and the mother in the hospital made this possible.

Despite the lack of amelioration in the proportion of prenatal assistance, there was a significant decrease in the proportion of fetal deaths. This reduction was probably a consequence of the standardization of a protocol of management of pregnancy based on the recent progress in scientific and technological knowledge². In 1996, according to official data³, 14.3% of pregnant women in Brazil did not receive any kind of prenatal assistance. This proportion is less than that found in our study group (25.6%).

The authors observed a high rate of adolescent mothers. This is a very common finding in developing countries, but it is not an exclusive figure from these countries. Despite prevention efforts at the state and federal levels, adolescent pregnancy rates in the United States are among the highest in the developed countries⁴. In Brazil, adolescent pregnancy is about 22% of all deliveries^{5,6}.

The high proportion of adolescent mothers was correlated with a lower incidence of prenatal assistance. However, this difference did not account for higher incidence of fetal deaths in this group of women. On the other hand, elderly mothers presented a higher proportion of prenatal assistance when compared to the mothers in the 20-34 year-old group, but a lower incidence of fetal death was not found.

In a prospective and comparative study performed in the Netherlands, Smit et al.⁷ did not find any difference between elderly and younger pregnant women, except for a lower average birth weight for the elderly group, probably related to a higher rate of cesarean section in this group⁸. Similarly, Anate and Akeredolu⁹ in another comparative study also found a significantly ($p < 0.001$) higher rate of cesar-

Table 6 - Type of delivery during 6-year study.

Year of study	Total	Cesarean Section	%	Vaginal Delivery	%	Forceps Delivery	%
1993	1650	844	51.1	384*	23.3	421*	25.5
1994	1747	946	54.1	381	21.8	419	24.0
1995	1918	1038	54.1	519	27.1	361	18.8
1996	2018	1142	56.6	613	30.4	262	13.0
1997	2004	1109	55.3	566	28.2	329	16.4
1998	2396	1280	53.4	751*	31.3	365*	15.2

* - $p < 0.01$

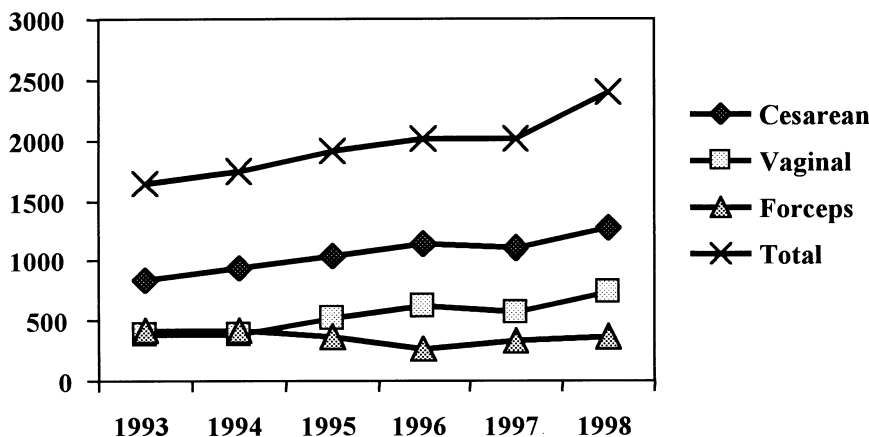


Figure 5 - Number and type of delivery during the study. Note that the proportion of cesarean section increased but not significant ($p > 0.05$). The proportion of vaginal delivery without forceps increased ($p < 0.01$) and the proportion of forceps delivery decreased significantly ($p < 0.01$).

Table 7 - Type of delivery according number of fetuses.

No. of fetuses	No. of pregnancies	Cesarean Section	%	Vaginal Delivery	%	Forceps Delivery	%
Singleton	11,165*	5956	53.3	3170	28.4	2039	18.3
Twins	258	177	68.6	59	22.9	22	8.5
Triplets	15	15	100	-	-	-	-
Quadruplets	1	1	100	-	-	-	-
Total	11,439	6149		3229		2061	

* - In 2 pregnant women with singleton pregnancy, the type of delivery was not specified. In 1 case of uterine rupture, an emergency laparotomy was performed.

ean section among elderly mothers. In the present study, the rate of cesarean section in the elderly group was also significantly higher (64.8 %) than in the younger patients. However, there were no differences in the birth weights among maternal age groups.

Preterm birth has been, and continues to be one of the most serious problems in obstetrics. It is the most com-

Table 8 - Type of presentation.

Fetal Presentation	No. of pregnancies	%
Cephalic	10,679	91.2
Pelvic	995	8.5
Transverse	30	0.3
Total	11,704	

* - In 29 pregnant women, the type of Presentation was not specified.

mon cause of neonatal death and morbidity in surviving infants¹⁰. Premature labor cannot be prevented effectively¹¹. In this study, there was an extremely high incidence of premature labor. This is mainly due to the high incidence of associated maternal and fetal diseases in the patients of this study, which is a characteristic of our institution. However, there was a significant decrease in these figures during the 6 years of the study. On the other hand, the rate of post-term deliveries remained stable during the period of this study. This is because we interrupt gestation at the 42nd week, following our protocol of management of pregnancy. There is still debate as to whether active induction is advisable for post-term pregnancy. Some authors^{12,13} believe that routine induction of labor in postdate pregnancy may reduce perinatal morbidity, while others suggest that there is no difference in the fetal outcome without active induction of the labor¹⁴.

The frequency of twin births in the

present study (2.4%) and sex ratio were similar to other studies in the literature^{15,16}. The twinning rate was strongly correlated with maternal age; the rate for mothers over 35 years of age was about 2 times higher than for mothers younger than 20 years, as has also been found in other studies¹⁷.

As seen in another study¹⁸, the average duration and the average birth weight decreased as the number of fetuses increased. Retarded fetal growth and preterm delivery are both important etiologies of low weight in multifetal gestations. These factors may have contributed to the higher incidence of fetal death in this particular group of pregnancies.

The proportion of cephalic, pelvic, and transverse fetal presentation found in the present report were similar to those found in some other studies^{7,8,11,15}.

Fetal macrosomia is a condition that may increase the risk of mechanical and/or dynamic problems for the patient¹⁹. The incidence of fetal mac-

rosomia varies in the literature between 5.6% and 6.3%^{20,21}. In our hospital, the incidence of birth weights of 4000 g or more was only 3.1%. The incidence of macrosomia in post-term pregnancy is twice as high as that in term delivery.

Although the incidence of both emergency and elective cesarean section is increasing in developed countries²², this incidence is much higher in developing countries such as Brazil. In our service, the overall rate of cesarean section was 54.2%. This may be due to the increased rate of co-existing maternal diseases in our department, which is a tertiary referral service, as well as the existence of two or more previous cesarean sections (contraindication of vaginal delivery in our protocol). According to an international study, Brazil has one of the highest rates of cesarean section (32%). The United States reported a rate of 19%, while Japan and Czechoslovakia reported rates lower than 10%²³.

RESUMO

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SCHUPP TR e col. – Levantamento dos partos ocorridos em um Hospital Universitário: um estudo de seis anos. **Rev. Hosp. Clín. Fac. Med. S. Paulo** 55(4):137-144, 2000.

Com o objetivo de avaliar alguns dados perinatais da Clínica Obstétrica do Departamento de Obstetrícia e Gi-

necologia do Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo, os autores apresentam um levantamento de todos os partos ocorridos no período entre 1993 e 1998. O número de partos aumentou em 45% neste período. O número total de óbitos fetais foi de 526 (4,48%) com redução estatisticamente significa-

tiva ($p < 0,05$) neste período. Entretanto, não houve aumento concomitante da proporção de gestantes que tiveram assistência pré-natal, que poderia explicar esta melhora. A incidência de parto prematuro também apresentou uma queda significativa.

Os autores acreditam que o aumento do número de partos foi principal-

mente devido ao aumento do número de gestantes encaminhadas ao nosso serviço. Entretanto, este atendimento não teria sido possível sem os esforços para aumentar a rotatividade dos recém-nascidos no berçário e a diminuição do tempo de internação da partu-

riente.

Apesar deste aumento, houve melhora nos resultados dos partos realizados no serviço, durante o período de estudo. Esta melhora pode ter sido reflexo da utilização, por equipe homogênea, de padronização através de con-

duta assistencial uniforme baseada no amadurecimento e aprimoramento técnico-científico dos últimos anos.

DESCRITORES: Gravidez. Assistência Pré-Natal. Hospital Universitário.

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