COMPARING THE OUTCOMES OF LABOUR INDUCTION WITH MISOPROSTOL AND DINOPROSTONE AT AMINU KANO TEACHING HOSPITAL KANO NORTHWEST NIGERIA.

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ABSTRACT

Context: Induction of labour is an old procedure performed to artificially terminate pregnancy for various indications in the interest of the mother, the fetus or both. The aim is to achieve vaginal delivery. Various methods have been in use which include the use of Misoprostol, Dinoprostone, oxytocin infusion and others. In an effort to determine which agent gives better outcome studies were carried out comparing the agents with one another.

Objectives: To compare the outcomes of labour induced with Misoprostol and Dinoprostone and to determine the incidence of induction of labour at Aminu Kano Teaching Hospital Kano Nigeria.

Materials and Methods: The study was restrospective involving a total of 364 patients admitted for labour induction between January 2005 to December 2009. Out of this 274 were induced with Misoprostol and 90 were induced with Dinoprostone.

Results: The incidence of labour induction is 2.35%. The indications include postdatism, Hypertensive disorders of pregnancy, PROM, IUFD and others such as Sickle cell disease, and Diabetes Mellitus. The most common indication was postdatism 45.9%. The success rate was 83.9% for Misoprostol and 82.2% for Dinoprostone. There is a statistically significant difference in terms of shorter induction delivery interval in favour of Misoprostol. There were less number of babies with APGAR score less than 6 in the Misoprostol group. There is no statistically significant difference in terms of the spontaneous vaginal deliveries and caesarean section rates between the two groups.

Conclusion: The rate of induction of labour in the centre is 2.35%. Misoprostol was found to be a more efficient and safer agent for induction of labour if the procedure is well managed. It was associated with shorter induction delivery interval without compromising the fetomaternal outcome compared to Dinoprostone.

Keywords: Induction of Labour, Misoprostol, Dinoprostone, Outcome.

INTRODUCTION

Induction of labour is the termination of pregnancy of gestational age 28 weeks or more by artificial means with the aim of achieving vaginal delivery[1].

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Labour induction is among the most frequent procedures performed in pregnant women and many studies have demonstrated that cervical ripeness is one of the most important factors in predicting a successful labour induction[5]

The history of labour induction dates back to Hippocrates' original description of mammary stimulation and mechanical dilatation of the cervical canal[2]. In 1948 Theobald and associates introduced the intravenous administration of oxytocin for labour induction[3] Karim and colleaques were the first to report the use of prostaglandins for labour induction[2]. Prostaglandins are now the focus as important mediators and possible initiators of uterine contractions[8]. Labour induction with prostaglandin F2α was introduced in the 1960s and subsequently formulations of prostaglandin E_2 (Dinoprostone) were developed which largely replaced the use of PGF2α[4]. Thus far, prostaglandins, particularly PGE, have been shown to be the most effective agents in achieving cervical ripening[5]. Dinoprostone has been the agent of choice for preinduction cervical ripening for several decades and currently the only pharmacological agent approved by the United States of America Food and Drug Administration for this purpose[6]. The most common route of administration is vaginal. Tablets, suppositories, gels and pessarries have been developed. With the use of dinoprostone many patients will require oxytocin augmentation which is one of its drawbacks. Other drawbacks include prolonged induction delivery interval and because it is temperature sensitive requires continued refrigeration up to the time of use. This may not always be possible in developing countries like ours. Another important problem with its use is affordability as its cost is very high. A 10 mg vaginal insert costs N6,720[6] which most patients in deprived areas cannot afford.

In an attempt to find an agent with better attributes misoprostol was recently introduced. It is an orally active prostaglandin E1 analogue originally used for the treatment of peptic ulcer. It has entered clinical use in obstetrics and gynecology on a wide scale without having been registered for such use[7]. It has no significant vasoactivity in humans[8]. It is cheap, a 200 microgram tablet costs about N150 and can be afforded by many patients[6]. It is active by oral, vaginal and rectal routes for induction of labour[9,10]. It can be stored at room temperature with shelf life of several years[11,12]. Its safety has been established by several pharmacological studies and extensive experience in its use as an anti-ulcer drug[13]. It ripens the cervix and also enhances uterine contractions, thereby reducing the need for oxytocin[14]. These factors make misoprostol very attractive as an agent for labour induction.

Because dinoprostone (PGE2) is widely recognized and accepted as a standard method of labour induction, alternative methods which are less well established are compared with it as the gold standard[4]. In an effort to determine which agent or method of induction has minimal fetomaternal side effects, gives the best possible fetomaternal outcome and can be monitored, various studies were conducted. The efficiency of oxytocin for induction of labour has been studied[1]. Other studies evaluated misoprostol for induction of labour[6,8,15]. Some studies were comparing the various agents against one another with a view of determining which is one more efficacious. Such studies include that comparing Misoprostol Vs oxytocin[16,17,18], Misoprostol Vs dinoprostone[19,20,21,22,23],Foley's

catheter plus titrated oral misoprostol solution, titrated oral misoprostol alone and dinoprostone[24], as well as misoprostol and placebo[6]. Induction of labour has been an important obstetrical procedure because its application has implication for both the mother and the fetus. A good outcome is always what the obstetrician aspires to achieve and the mother will wish to have.

It is for this reason that studies must continue comparing agents and methods that will give the best possible fetomaternal outcome. It is in the light of this that this study was conducted. The study is aimed at comparing the outcome of labour induction with Misoprostol and dinoprostone and to determine the incidence of induction of labour at AKTH.

MATERIALS & METHOD

The study was retrospective comparing the outcome of labour induction with Misoprostol and Dinoprostone.

It was carried out at the Obstetrics and Gynaecology Department of Aminu Kano Teaching Hospital Kano, between January 2005 to December 2009. The study population consisted of all women admitted for induction of labour within the study period. Case records of patients were obtained from the Records Department with supplementation from antenatal and labour ward reords.

Misoprostol and Dinoprostone were routinely used for induction of labour within the study period. The dose of Misoprostol used was 50 microgram except for high parity patients in whom 25 microgram was used. A 200 microgram of Misoprostol is broken in to approximately four equal parts. With the patient in dorsal position a piece 50 microgram is inserted into the posterior fornix with the gloved right hand while parting the labia with the gloved left hand. This is done six hourly for a maximum of 4 doses until labour begins. The Bishop score is assessed before the first insertion and before each subsequent insertion. The dose of Dinoprostone used was 1.5 mg which is inserted into the posterior fornix six hourly for a maximum of 3 doses.

Sociodemograhic data recorded include age and parity of patients, pre-induction Bishop scores, weights and heights of patients, birth weights of babies delivered, induction delivery intervals, APGAR scores of babies, mode of delivery and indication for induction. Data was analysed using Epi-Info software version 3.4.1, July 3 2007. The results were given in percentages and tables and bar chart were used to display the data. Chi square and z test where used to test for significance at 95% confidence interval.

RESULTS

Table 1: Demographic characteristics of patients who had induction of labour at AKTH 2005-2009.

Variables	Age group	No. Of patients induced with misoprostol	Percentage (%)	No. Of patients induced with dinoprostone	Percentage (%)
Age	20-24	68	24.8	22	24.4
	25-29	76	27.7	24	26.7
	30-34	90	32.8	26	28.9
	35-39	26	9.5	12	13.3
	40+	14	5.1	6	6.7
	Total	274	100.0	90	100.0
Parity	0	86	31.4	26	28.9
	1	40	14.6	14	15.6
	2	34	12.4	12	13.3
	3	26	9.5	8	8.9
	4	16	5.8	6	6.7
	5+	72	26.3	24	26.6
	Total	274	100.0	90	100.0

figure 1: Indications for induction of labour.

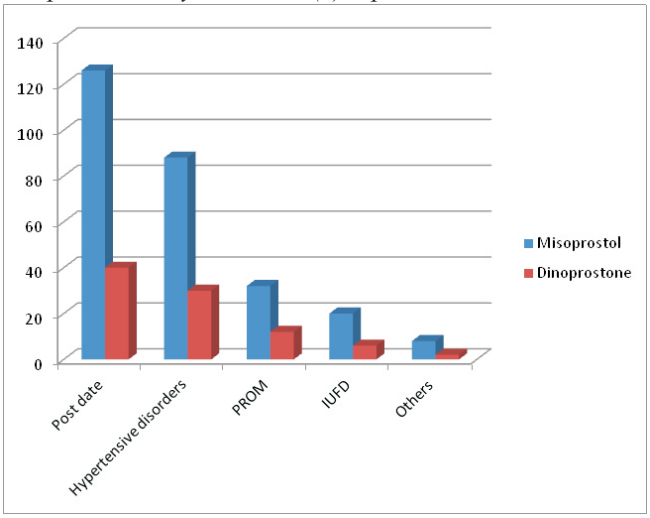

Table 2: Mode of delivery:

	C/S	SVD	P-Value	OR	CI
Misoprostol	**44(16.1%)**	**230(83.9%)**			
Dinoprostone	**16(17.8%)**	**74(82.2%)**	**0.8276634**	**0.88**	**0.45-1.74**
Total	**60(16.5%)**	**304(83.5%)**			

Table 3: Apgar Score:

	<6	>6	P-Value	OR	CI
Misprostol	**24(8.8%)**	**250(91.2%)**			
Dinoprostone	**22(24.4%)**	**68(75.6%)**	**0.0002133**	**0.30**	**0.15-0.59**
Total	**46(12.6%)**	**318(87.4%)**			

Table 4: Induction delivery Interval (IDI):

	>12hrs	<12hrs	P-Value	OR	CI
Misoprostol	22(8.0%)	252(92%)			
Dinprostone	64(71.1%)	26(8.9%)	0.0000	0.04	0.07
Total	86(23.6%)	278(76.4%)			

Table 5: Mean bith weight of babies delivered, Mean maternal height, and Mean Bishop score at induction.

	Misoprostol	Dinoprostol		
Mean birth weight (MBW)	**3.28±0.79kg**	**3.3±0.68kg**	**Z=0.15**	**P>0.05**
Mean maternal height (MMH)	**1.6±0.05m**	**1.5±0.07m**	**Z=0.52**	**p>0.05**
Mean Bishop score at induction (MBS)	**8±2.02**	**8.21±1.72**	**Z=1.75**	**P>0.O5**

DISCUSSION

The rate of induction of labour in our centre is 2.35% of all deliveries. Which is lower than 3.0% that was reported from Sokoto[15], and lower than 5% reported from South Africa[25]. It is lower than 23% reported from developed countries[26]. The indications for induction of labour from this study are similar to those reported from Sokoto North West Nigeria[15].

The overall success rate for labour induction in this study was 83.5% which is similar to 82% reported from Sokoto[15]. It is however lower than 90.40% reported from Benin South South Nigeria[1]. The reason for this difference may be due to the fact that in the Benin study induction was restricted to women carrying term pregnancies, while some patients were not at term in our study.

The two groups of patients in the study share similar characteristics such, mean Bishop score at induction, mean maternal height and mean birthweight of babies delivered. There is no statistically significant difference in these parameters (table 5).These provide a valid basis for comparison and thus eliminates bias. The similarities in the two groups is probably because they are from the same community.

This study revealed that there was no statistically significant difference in the number of spontaneous vaginal deliveries or caesarean section rates between the two groups (table2). Studies elsewhere gave similar results[27,6,28]. This result is however in variance with what was reported by workers elsewhere[29,22] in which the caesarean section rate was found to be higher. The difference in caesarean section rate in the two studies were attributed to the greater number of caesarean sections done on account of fetal distress in the Misoprostol group. The difference is probably due to the difference in

Misoprostol protocol, where they used 25 micrograms while we used 50 micrograms for most patients except those with high parity were 25 micrograms was used.

This study showed that the induction delivery interval was shorter and delivery within 12 hrs was much higher in the Misoprostol group (table4). Other studies reported similar findings[27,29]. Misoprostol being more efficient as a cervical ripening agent as well as an inducer of labour is likely to give a shorter induction delivery interval compared to Dinoprostone[1]. It may also be that because of its low cost Misoprostol is used more often compared to Dinoprostone which is more costly and many patients cannot afford it.

Newborn APGAR score of less than 6 was statistically significantly higher among the Dinoprostone group (table3).The difference may be attributed to the longer induction delivery interval (IDI) in the Dinoprostone group which means that babies in this group were subjected to more stress of labour and hence were more prone to fetal distress and lower APGAR score at delivery. Since the mean Bishop's score at induction was not statistically different in the two groups (table5) it may not be the factor that led to the finding of more babies with APGAR scores less than 6 in the Dinoprostone group and also more patients with IDI less than 12hrs in the same group. Other studies have however not shown a statistically significant difference in APGAR score less than 6[29], probably because in their study uterine hyperstimulation were more in the Misoprostol group, and also probably because of the difference in the protocol of management of use of Misoprostol for induction of labour.

CONCLUSION The rate of induction of labour in our centre is 2.35%. Misoprostol was found to be a more efficient and safer agent for induction of labour if the procedure is well managed. It is associated with shorter induction delivery interval without compromising the fetomaternal outcome compared to Dinoprostone. Based on these findings it will appear that Misoprostol is a better choice when induction of labour is being considered. The study was retrospective and is therefore limited by factors that affect the quality of retrospective studies. To confirm or dispute the findings of this study well designed prospective studies will be needed.

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