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Original Research Article

To determine the burden of ectopic pregnancy in the tertiary care centre (TRIHMS) of Arunachal Pradesh and its implication on the type of surgical and anaesthetic management

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ABSTRACT

Background: The incidence of Ectopic Pregnancy (EP) is 1 – 2% in India, with mortality rate of none to 3.5%. It is considered to be emerging as one of the leading problem for woman's fertility with major mortalities in reproductive age group.In this study we had intended to find out the incidence of EP in tertiary care centre of Arunachal Pradesh along with clinical presentation and mode of surgical and anaesthetic management.
Materials and Methods: After clearance from Institutional ethics committee, patients' with diagnosis of ectopic pregnancy, whether elective or emergency were included in this study. This study aimed to determine the incidence of EP, type of surgical intervention and mode of anaesthesia.
Results and Observation: 81 diagnosed cases of EP admitted in obstetrics ward were enrolled for this study. The incidence of EP was 22.9 per 1000 deliveries in tertiary care centre of state of Arunachal Pradesh. Emergency contraceptive pill intake was single most leading risk factor in this study, with history of intake in 28.4% of the cases. 85.2% cases had salphingectomy and 90.1% surgeries were conducted under spinal anaesthesia
Conclusion: EP may be rising in recent trends due emerging use of contraceptive and other reproductive techniques. We conclude that the ectopic pregnancy is major cause of morbidity in reproductive female age group; however, with timely diagnosis and collaborative obstetrical and anaesthetic management, its mortality can be reduced significantly.

1. Introduction

When a fertilised egg implants outside the uterus is called an Ectopic Pregnancy (EP). The incidence of ectopic pregnancy ranges 1 - 2% in India and 2 – 5% in patient who had history of usage of artificial reproductive technology.[1] However, there are marked difference in the mortality ratios around the globe, with none mortality to 3.5%.[2] Wakankar R and Kedar K in their study of ectopic pregnancy: a rising trend, mentioned that it is a challenge to Obstetrician, and is assuming greater importance because of it rising trend and impact on woman health and fertility. It may not be leading cause of mortality in India but becoming a leading cause of morbidity with Jeopardy to woman's fertility.[3]

Ectopic pregnancy can present in variety of clinical presentations, with no symptoms to acute abdomen and shock. The presenting complaint may vary vastly depending on ruptured or unruptured status of implantation site. The classic triad of EP is abdominal pain, bleeding per

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vagina and amenorrhea/ positive urine human chorionic gonadotropin (β-hCG).[4–6] Diagnosis of EP is done by clinical presentation and ultrasound (USG) imaging. In USG, gestational sac may localise at ectopic site or if rupture, marked free fluids may be seen with empty gestational sac at uterus with positive urine β-hCG. The site of ectopic implantation is commonest in ampulla of Fallopian tube, followed by fimbria of tube, isthmus of fallopian tube, cornua (interstitial) and ovary. Post caesarean cases may present with scar ectopic implantation.[7]

Management of ectopic pregnancy vastly depend upon the clinical status of the patient. Medical management with Methotrexate have been reported successfully in stable patients. Ranji GG et al[4] report 83.33% success with Methotrexate therapy, whereas Panelli et al[1] reported 85%. Surgical interventions are needed in patients with failure of medical therapy or presenting with acute clinical condition due to ectopic ruptured. Patients' for emergent laparotomy with unstable haemodynamic is not a contraindication in life threatening condition such as in EP, where urgent surgery is life saving procedure.[8] When diagnosed is made in stable patient with unruptured EP, laparoscopic surgery is considered to be better for most of the ectopic pregnancies where facilities are available, however in developing countries; laparotomy with salpingectomy is one of the commonest methods of intervention.[9,10]

This study intended to determine the incidence of ectopic pregnancy in tertiary care centre of Arunachal Pradesh. It aimed to find out the site of ectopic implantation and mode of surgical management with determination of the type of anaesthetic management in term of Hemodynamic stability.

2. Materials and Methods

This study was conducted in Department of Obstetrics and Gynaecology in collaboration with Department of Anaesthesiology, Tomo Riba Institute of Health and Medical Sciences, Naharlagun, Arunachal Pradesh. After Clearance from Institutional ethics committee, we included 81 patients with diagnosis of ectopic pregnancy in year 2021 (elective or emergency). Surgical management was determined by site of EP and clinical status of patient. The mode of anaesthetic management was targeted to maintain systolic blood pressure (SBP) of more than of 90 mm Hg, Heart rate of <120 beats per minute along with haemoglobin ≥ 9 gm/dl. After pre-anaesthetic evaluation as per institutional norm, cases were taken up under general anaesthesia or spinal anaesthesia.

3. Results and Observation

Sample size was calculated considering expected Incidence of 1%, confidence interval of 95% and error rate of 5%. Total of 3535 patients attended obstetrics ward in the year 2021. 81 cases of ectopic pregnancy were included in this study. The case rate was 2.29% and the incidence of ectopic pregnancy was 22.9 per 1000 deliveries (NVD or LSCS) in Tertiary care Hospital of Arunachal Pradesh. Out of 81 cases presenting with ectopic pregnancy, 31% of them were Primigravida (Table 1). The mean age of cases presenting with ectopic pregnancy was 27 years (SD ± 5.05).

Table 1: Demographic Profile of the patients

Variants		Parameters
Mean Age (yrs)		27 years SD ± 5.07
Gravida	Primigravida	25 (31%)
	Multigravida	56 (69%)

The minimum and maximum age included in this study was 18 year and 40 year of age. The age group between 26 to 35 years accounted for the maximum number of cases.

Table 2: Distribution EP with age

Age (yrs)	Total
<20	7 (08.6%)
21 - 25	25 (30.9%)
26 – 30	32 (39.5%)
31 – 35	10 (12.4%)
>35	7 (08.6%)

All the patients with diagnosis of ectopic pregnancies had pain abdomen of varying degree from minimal to excruciating, as their chief complaint. 28.4% of them had associated bleeding per vaginum. 7 patients came with shock and were resuscitated but one of them succumbed to the condition. 66.7% of cases attended in obstetrics ward were found to anaemic with haemoglobin level < 9gm per dl. On ultrasonography peritoneal fluid collection was the most common finding associated with or without mass. Intraoperative finding of ruptured ectopic pregnancy was seen in 69.1% of the cases (Table 3).

Table 3: Showing clinical presentation

Clinical Finding		Total	Percentage
Pain		81	100%
Bleeding per Vaginum		23	28.4%
Shock		04	04.9%
Anaemia (Hb% ≤ 9gm)		54	66.7%
Ruptured EP		56	69.1%
Failed Medical Management		2	2.5%
Ultrasound finding	Peritoneal fluid collection	31	38.3%
	Mass	13	16.0%
	Collection + Mass	17	21.0%
	Normal	01	01.2%

From our study (Table 4), we found that usage of emergency contraceptive pill as single most common factor associated with ectopic pregnancy accounting for 28.4% of all the cases. Used of contraceptive pill in

any form was found to be most common risk factor followed by history of interventional medical termination of pregnancy in 22.2% of cases. Other risk factor in descending order were history of previous caesarean delivery, pelvic inflammatory disease, assisted reproductive technology, uses of intrauterine devices or history of gynaecological surgeries. 8.1% of the cases could not be link to any kind of risk factor.

Table 4: Risk factor distribution

Variables		Total	Percentage
Patients with H/O of any medication	Self medication or I-pill user	23(28.4%)	37.0%
	Oral Contraceptive user	07(08.6%)	
Patients with H/O surgery	Previous abortion	18(22.2%)	34.9%
	Previous LSCS	09(11.1%)	
	Previous Ectopic Sx	01(1.2%)	
	Gynae. Surgery	02(02.5%)	
H/O Infertility		05(06.2%)	5.8%
With IUCD		04(04.9%)	4.7%
H/O PID		08(09.9%)	9.3%
No finding		07(08.6%)	8.1%

From the following Tables 5 and 6, 85.2% cases had laparotomy and salphingectomy. Laparoscopic salphingectomy was done in only one case. Ampullary area was found to be commonest (49.4%) site of ectopic pregnancy, which was followed by Isthmus, fimbrial, cornual and ovary. We have found two cases of scar implantation and thereby they were managed by scar resection.

Table 5: Type of Surgery

		Total no.	Percentage
Laparoscopic Salphingectomy		01	1.2%
Salphingectomy	Right	38	46.9%
	Left	31	38.3%
Cornual Resection		07	8.6%
Scar excision		02	2.5%

Table 6: Distribution of site of ectopic implantation

Site	Total	Percentage
Ampullary	40	49.4%
Isthmas	16	19.7%
Fimbria	14	17.3%
Cornu	07	08.6%
Ovarian	02	02.5%
Scar adhesion	02	02.5%

Other than four cases who had presented with shock, three patients' presented with unstable haemodynamic parameters and thereby managed with general anaesthesia with fluid and blood infusion (Table 7). They were resuscitated successfully except one who succumbed to the condition. 90.1% of the cases diagnosed with ectopic pregnancy could however be managed with spinal anaesthesia but needed adequate fluid with or without blood infusion. 71.2% had spinal hypotension and thus given Mephentermine 3mg bolus and repeated when necessary. 49.4%of the casers needed blood transfusion due to low haemoglobin of less than 8gm per dl.

Table 7: Mode of Anaesthetic management

Type of Anaesthesia	**GA**	08 (9.9%)
	SA	73 (90.1%)
Spinal Hypotension		52 (71.2%)
Blood Infusion (If Any)		40 (49.4%)
Death		01 (1.2%)

4. Discussion

Incidence of EP according to FOGSI 2020 in India is 1 – 2%.[2] Studies suggest rising trend in cases of ectopic pregnancy due to better and sensitive diagnosis facility.[3,11,12]

In our study we found incidence rate of EP to be 22.9 per 1000 deliveries or 2.29 %, which is higher than the national incidence as well the incidence reported in north-eastern part of India.[11,13] But our finding was lower than study of Ranji GG et al[14] who reported occurrence of EP to be 2.81% where she included cases which were manage medically as well as surgically. However the mortality rate in this study was 1.2% which is comparable to national mortality rate of $\leq$ 3.5%.[2] The highest rate of EP occurred in age group of 26 to 30 years of age which is concomitant with finding of Barik et al.[12] Multigravida accounted 69% of the cases in this study.

Used of oral emergency contraceptive pill was single most common risk factor associated with EP. History of OCP usage was found in 37.0% of the cases and emergency pill use alone was 28.4%, followed by MTP in 22.2% patients. Our finding with history of emergency pill usage was comparable to the finding of Surie et al.[15] Decrease intrauterine pregnancy occurs with emergency contraceptive usage but occurrence of EP in emergency pill failure is a known factor[16] as reported by case study and various scientific reviews.[17,18] Our study finding is comparable to the finding of Barik et al,[12] who in their study suggest that there is significant risk for the development of ectopic pregnancy among emergency contraceptive pill users compared to non-users, which could be attributed to failure rate. We also agree that there is increased uptake of emergency pills due to the easy accessibility to

the Levonorgestrel only pills for emergency contraception. However, there could also be women who are not educated enough of its use and may used it without strictly adhering to the guidelines. To educate woman before taking emergency pill and adherence to the guideline should be emphasised along with avoidance of sexual intercourse after pill in same cycle.[18] Medical termination of pregnancy was seen to be second leading risk factor for ectopic pregnancy in this study, which was followed by various obstetrical or gynaecological surgeries. 5.8% of the cases presented have history of assisted reproductive technological procedure which is found to be comparable to the finding of study by Panelli D M et al.[1]

In this study all the patients had pain abdomen; these may be due to the fact that the included cases were only diagnosed ectopic pregnancy admitted in obstetrics ward for routine or emergent surgery. Thereby, we agree with Hendrick E et al,[7] that incidence of EP may be underestimated as we are not including cases in office based management.

86% of the cases had ectopic implantation in fallopian tube whereas the national figure is 97%.[2] Thus salphingectomy accounted for maximum of the surgeries. One case was done under routine lapascopy since the patient was stable and diagnosed on routine sonography with complaint of mild pain abdomen. As found in various studies, ampullary ectopic pregnancy was the commonest site of EP. Cases of ruptured ectopic was 69.1% and were managed with emergent surgery. Large number of ruptured EP may be due to cases coming from far off areas to tertiary care centre of the state and time taken to reach the institution from district hospital. Ectopic implantation in scar following CS delivery was seen in two cases where scar resection was done. We agree with theory of mention by Panelli et al[1] that thechances of scar implantation may be more common following caesarean sections for elective indications due to impaired healing of an unlabored lower uterine segment.

In our study, modes of anaesthetic management in 90.1% of the cases were spinal anaesthesia (Bupivacaine H 0.5%). 8 cases were operated under general anaesthesia. This finding is in contrast with the finding of Majeeb AB et al,[19] who had general anaesthesia for all EP. Transfusion was started if patient had haemoglobin less than 8 gm/dl. Resuscitation is a continuous process to enable patient for urgent life saving surgery. Therefore, marked pallor with haemodynamically unstable (SBP < 90 mm Hg) vital sign was not considered contraindication to surgery because resuscitation will be successful if bleeding is controlled in ruptured EP.[8] Four patients came with shock and needed at least 4 unit of packed red blood cell transfusion preoperatively along with fluids and vasopressor agents (dopamine infusion). One case succumbed to the condition post-operatively in ICU.

No patient who had preoperative systolic blood pressure lowers than 100 was undertaken in spinal anaesthesia. Spinal anaesthesia is known to provide quicker recovery with conscious patient, decreased nausea/vomiting post operatively, less postoperative pain, shorter post-operative stay, improved patient satisfaction, better overall safety and fewer hemodynamic changes.[20] We recorded spinal induced hypotension as less than 90 mm Hg, which was seen in 71.2% of the cases. Minimum of 10 - 20ml/kg of crystalloid was infused regardless of patients' clinical status and SBP and supplemented with vasopressor when required. We agree with the study finding of Bishop DG,[8] that spinal anaesthesia is acceptable in stable patient. Availability of crossed matched blood must be ensured regardless of nature of surgery and blood infusion was given based on clinical status of the patient, suspected bleeding, or anaemia with haemoglobin level less than 8 mg/dl.

5. Conclusion

The incidence of ectopic pregnancy is 2.29% (22.9 per 1000 deliveries) in tertiary centre of Arunachal Pradesh, which is higher than national average which may be due to the fact that TRIHMS is tertiary care centre and cases are being referred from different part of state. From this study, the single most common risk factor for ectopic pregnancy was usage of emergency contraceptive pill among the admitted cases in obstetrics ward. Thus we summarise that along with availability of more sensitive diagnostic aids, evolving trend of contraceptive use or more cases of caesarean delivery, MTP, ART may be cause of increase trend of ectopic pregnancy. We did not find any previous study of this kind in the state, thus we cannot compare the previous incidence of EP in state. Commonest site of ectopic implantation was ampulla of the fallopian tube and thus Salphingectomy accounts for the maximum surgeries. Majority of the cases could be managed under spinal anaesthesia with adequate perioperative fluid therapy. We conclude that the ectopic pregnancy is major cause of morbidity in reproductive female age group; however, with timely diagnosis and collaborative obstetrical and anaesthetic management, its mortality can be reduced significantly. From the study finding we suggest more robust study including cases treated by medical management in office or outpatient basis as the incidence of the study finding may be underestimate of reality, as this study included only cases admitted and surgically treated in Obstetrics ward.

6. Conflict of Interest

None.

7. Source of Funding

None.

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