Inter-hospital emergency obstetric referrals to the labour ward of RIPAS Hospital

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ABSTRACT

Introduction: Inter-hospital emergency obstetric transfers should be carried out effectively and efficiently to avoid any complications to either mother or pregnancy. To date, no relevant data are available in Brunei Darussalam. This study prospectively assesses the strengths and weaknesses of the inter-hospital transfer process to the Raja Isteri Pengiran Anak Saleha (RIPAS) Hospital. **Materials and Methods:** Obstetric patients (n = 92) who were transferred from other hospitals to RIPAS Hospital over a six month period (1st September 2009 to 28th February 2010) were studied. **Results:** The prevalence of emergency obstetric transfers was 3.65% of total obstetric admissions to the labour ward and this consisted of 60 antenatal, 30 intrapartum, and two postpartum cases. The most common reason for transfer was gestational hypertension followed by labour pain. Multiple reasons led to 25% of referrals. Sixteen patients (17%) arrived without any accompanying medical personnel and 10 patients (11%) used their own transport. Duration from referral to arrival ranged from 25 minutes to 72 hours. Twenty-one patients (23%) and 18 (19%) arrived without any investigation or medications and without referral letters respectively. The mean hospital stay was 3.4 days. Two cases with singleton pregnancy were referred for intrauterine foetal deaths. Another 59 were born alive. There were no early neonatal deaths. **Conclusions:** Our study revealed deficiencies in the transfer procedures that can be improved. Fortunately, there were no adverse outcomes during the study period. Further improvements need to be implemented to ensure effective and efficient transfers of emergency cases.

Keywords: Pregnancy complications, pregnancy outcomes, transfer

INTRODUCTION

The Raja Isteri Pengiran Anak Saleha (RIPAS) Hospital situated in Bandar Seri Begawan is the only tertiary teaching hospital in Brunei Darussalam. It sees 4,500 to 5,500 deliveries per annum and accepts all emergency obstetric referrals from different primary and secondary health centres of Brunei Darussalam and

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also from Limbang Hospital, Malaysia. Although the labour ward of RIPAS Hospital has been accepting emergency obstetric referrals from hospitals (Tutong [Pengiran Muda Mahkota Pengiran Muda Al-Muhtadee Billah Hospital, PMMPMHAMB Hospital], Temburong [Pengiran Isteri Hajjah Mariam Hospital, PIHM Hospital], Jerudong Park Medical Centre (JPMC, private hospital), Kuala Belait [Suri Seri Begawan Hospital, SSBH] and Limbang, Malaysia), no data are available relating to the emergency referral of patients. We prospectively studied the prevalence and indications for inter-hospital transfer, the support provided to patients during the transfer process (preparatory diagnosis, advice and pre-transfer treatment, appropriate means of transport and support personnel, and appropriate management on arrival), and the time taken from departure to arrival at RIPAS Hospital. We also assessed the perinatal and maternal outcomes of cases requiring referrals. We propose an inter-hospital referral guideline to standardise and improve the referral and transfer processes with the ultimate goal of improving the maternal and perinatal outcomes.

MATERIALS AND METHODS

All emergency obstetric patients referred from any hospital to the labour room of RIPAS hospital directly or via the Accident & Emergency department over a six month period (1st September 2009 to 28th February 2010) were included in our study. Patient consent was obtained before inclusion in the study.

The time of referral to labour room was used as the "entry point" and maternal and neonatal outcomes, once known, were the "end point". Data were captured by a predefined proforma. Patient confidentiality was protected by means of de-identification of personal data. The first page of a predefined proforma was completed by the on-call obstetric medical officer when hospital-to-hospital obstetric emergency referral to the labour ward, RIPAS Hospital was received. When the referred patient arrived, the on-call obstetric medical officer provided both the patient information sheet and explanation regarding the purpose of the study before obtaining voluntary signed consent from the patient. The rest of the proforma was completed only regarding patients who had consented to participate in the study. The second page of the proforma was completed by the on-call obstetric medical officer after obtaining a detailed history and physical examination. The remaining part of the proforma was completed by the researchers when the patient was discharged from RIPAS Hospital.

Ethics approval was obtained for the study from the Medical and Health Research Ethics Committee (MHREC), Ministry of Health prior to the study recruitment.

RESULTS

During the study period, 92 inter-hospital emergency obstetric referrals were admitted to the labour ward of RIPAS Hospital giving a prevalence of 3.65% of all admissions to the labour ward. Of these referrals, 73 cases (79.3%) were referred from PAMMPAMB Hospital, 14 (15.2%) were from PIHM Hospital, three (3.3%) from JPMC and two (2.2%) from SSB Hospital. Sixty patients (65.2% of referral cases) were antenatal cases, 30 intrapartum (32.6%) and two (2.2%) postpartum.

The indications for inter-hospital

Table 1: Indications for inter-hospital referrals to RIPAS labour ward

Indications	**n (%)**
Gestational hypertension	17 (18.5)
Labour pain	14 (15.2)
Preterm labour	13 (14.1)
Suspicious cardiotocography (CTG)	12 (13.0)
Reduced foetal movements	8 (8.7)
Non-progressive labour	6 (6.5)
Term pre-labour rupture of membranes	6 (6.5)
Pre-term pre-labour rupture of membranes	6 (6.5)
Pre eclampsia	5 (5.4)
Haemorrhage	
Antepartum	4 (4.3)
Postpartum	2 (2.2)
Anaemia requiring transfusion	3 (3.3)
Others *	21 (23.9)

* Others included: multiple pregnancy (2.2%), gestational diabetes mellitus (1.1%), patients' request (2.2%), intra-uterine foetal death (2.2%), low amniotic fluid index (2.2%), abnormal foetal lie (1.1%), acute asthma (1.1%), acute gastroenteritis (1.1%), polyhydramnios (1.1%), cervicitis and vaginitis (1.1%), meconium stained liquor (1.1%) and high head station during labour (1.1%).

referrals are shown in Table 1. Twenty-three cases (25%) were referred with combinations of multiple reasons. Six cases (6.5%) had a combination of early labour, suspicious cardiotocography (CTG), reduced foetal movements, meconium stained liquor, gestational hypertension (GHT) or term pre-labour rupture of membranes (PROM). Five cases (5.4%) had early labour, reduced foetal movements, GHT or gestational diabetes mellitus (GDM). Four cases (4.3%) had preterm labour plus GHT or preterm pre-labour rupture of membranes (PPROM). Three cases were referred for term PROM plus GHT or reduced foetal movements. Two cases (2.2%) had twin pregnancies with PPROM and GHT while another two cases (2.2%) had PPROM plus antepartum haemorrhage (APH) or polyhydramnios. Finally, one case (1.1%) was referred for reduced foetal movements plus low amniotic fluid index (AFI).

The time interval from referral to arrival ranged from 25 minutes to 72 hours (Table 2). Both cases of 72 hour time intervals were from PMMPMHAMB Hospital.

The mean age of patients was 27 ± 5.8 years (range 16 to 43). Fifty-one cases (55.4%) were transferred under 37 weeks gestational age at referral and 41 (44.6%) were referred at 37 weeks and more. Thirty-five patients (38%) were nulliparous and 57 cases, including two postnatal patients (62%) were multiparous. Three patients (3.3%) had had no antenatal care and the remaining 89 patients (96.7%) had received antenatal care during the present pregnancy.

Four patients (4.4%) arrived at RIPAS Hospital without prior phone contact from the referring doctor but the patients were provided with a referral letter. Two patients were sent after phone contact with the staff nurse

Table 2: Time interval for transfer from referring hospital to RIPAS

	Time (hours and minutes)			
Referring hospital	**Minimum**	**Maximum**	**Mean**	**Standard deviation**
Tutong (PMMPMHAMB)	0:25	72:00	3:44	9:01
Temburong (PIHM)	1:35	19:55	4:01	4:41
Kuala Belait (SSB)	1:09	3:00	2:04	1:17
JPMC	1:09	3:00	2:04	1:17

in charge of the labour room. Eighty-six patients (93.4%) were transferred after a phone call from the referring hospital providing information to the obstetric on call team. Seventy-four patients (80.4%: PMMPMHAMB Hospital, 87.7%, PIHM Hospital 42.9%, SSB Hospital 100% and JPMC 66.7%) were provided with referral letters and 18 (19.6%) arrived at RIPAS Hospital without a referral letter from the referring hospital.

Figure 1 lists the medical personnel accompanying the referred patients. Of note is the fact that sixteen patients (17.4%) were not accompanied by any medical personnel: PMMPMHAMB Hospital (n=10), PIHM Hospital (n=5) and JPMC (n=1). Ten patients arrived using their own transport, three by boat and three by ambulance. Four patients were referred with multiple reasons; twin pregnancy with PPROM or GHT (n=2) and suspicious CTG plus reduced foetal movements plus early labour or GHT (n=2). Overall, seven patients were referred for significant obstetric emergencies (GHT, Pre-eclampsia, GDM with labour pain, mild antepartum haemorrhage secondary to placenta praevia, preterm labour, term PROM and intra-uterine foetal death). Five patients were referred for less serious conditions (patient's request, pregnancy with proximal myopathy, previous two LSCS scars with backache, pregnancy with vomiting and diarrhoea, and grand-multiparous woman with early labour pain).

Forty eight patients (52.2%) were accompanied to RIPAS Hospital by their immediate relatives and 44 (47.8%) arrived at RIPAS Hospital accompanied only by health personnel.

Figure 2 lists the form of transport used in inter-hospital transfer. Of note is the fact that ten (10.9%) patients arrived at RIPAS Hospital using their own means of transport (private car).

Twenty-one patients (22.8%) were not given any medication nor was any investigation carried out before transfer. Of these 21 cases, two patients with preterm labour had not been given a dexamethasone injection. The referring doctors had been advised by the RIPAS obstetric medical officer on call to give the first dose prior to transfer. Only nine (9.8%) patients needed advice from the on call team.

Of 83 cases, six were transferred without prior phone contact with the on call team. Seventy seven (83.7%) did not need advice from the on call team. The on-call

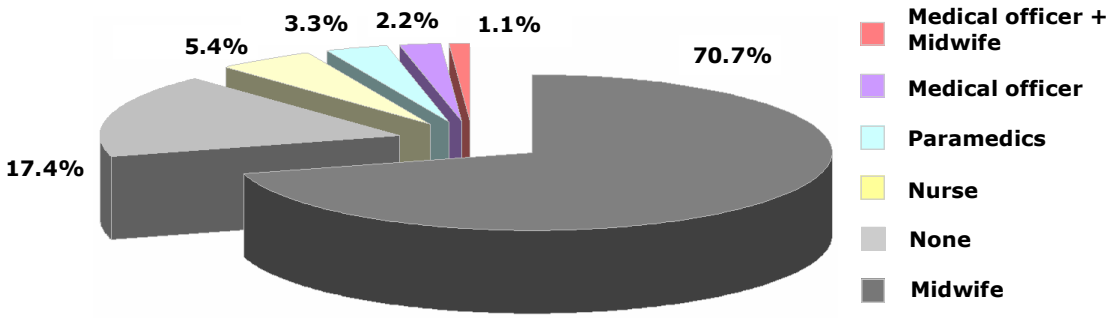

Fig. 1. Accompanying medical personnel.

obstetric medical officer at RIPAS Hospital was notified appropriately upon receiving a phone call from the referring hospital in 68 referral cases (73.9%) however in 24 cases (26.1%), the other on-call team members (Specialist obstetrician, anaesthetist, paediatrician, in-charge nurse) were not notified.

Overall, in 22 cases (23.9%) there were discrepancies between the reasons for referral and the final diagnosis.

The outcomes of the inter-hospital transfer cases are shown in Figure 3. Twenty six (28.3%) patients were discharged from RIPAS Hospital during the antenatal period without delivering. Two patients were referred as postnatal patients and one patient was referred as a case of septic abortion with retained placenta.

There were no intrapartum or intraoperative complications or admissions to the intensive care unit. Three patients (3.3 %) had postpartum complications; primary PPH (n=1), secondary PPH post delivery (n=1) and PPH due to a retained placenta after normal vaginal delivery at RIPAS Hospital (n=1). Of the three patients, two patients (2.2%) also had to undergo manual removal of retained placenta, one after septic abortion and the other after a normal vaginal delivery. Two (2.2%) cases required blood transfusions due to PPH; primary PPH (n=1) and septic abortion retained placenta (n=1).

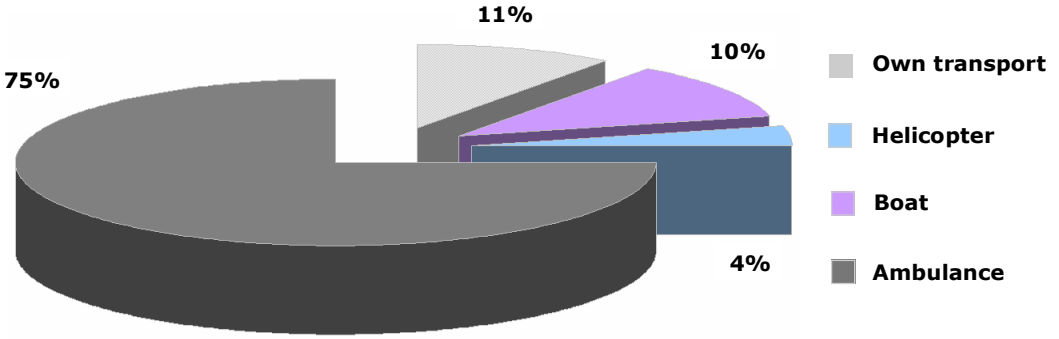

Fig. 2. The different types of transport used during inter-hospital transfer.

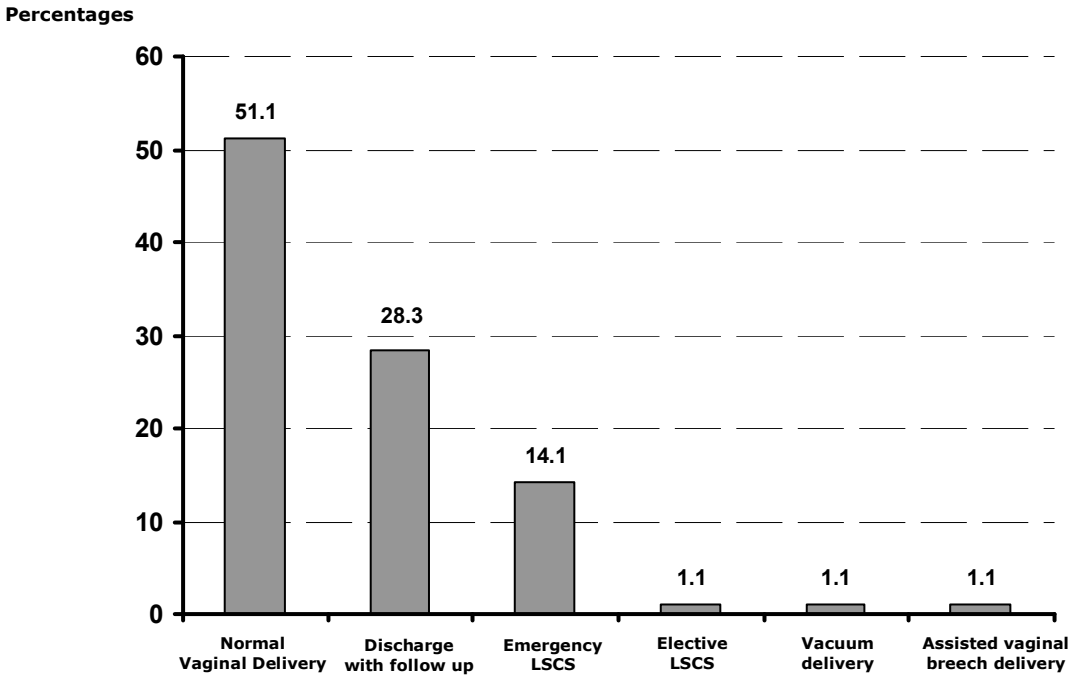

Fig. 3: Outcomes of referred patients.

The mean and median hospital stays were 3.4 and 2 days respectively (range 1-27 days). Twenty-four (26.1%) patients were discharged from RIPAS Hospital after a one day hospital stay. Twenty six patients were discharged during the antenatal period after receiving appropriate treatment. Two of them had been referred post-natally, and one was a case of septic incomplete abortion. There were two twin-pregnancy cases, in which all the babies were born alive.

Table 3 shows the details and outcome of 61 singleton babies. Fifty-nine of these were born alive and there were only two cases of still-birth. These two still-birth cases had been referred to RIPAS Hospital for intra-uterine foetal death (IUFD).

Two pairs of twins had less than 2.5 kg birth-weight (preterm babies). Both sets of twins were boys. All the babies of twin pregnancies had an Apgar score > 7. Both pairs of twins were admitted to SCBU for prematurity. There were no cases of early neonatal death.

DISCUSSION

Studies to date on inter-hospital transfers have mainly been done in specialties such as emergency medicine [2, 3, 4] or anaesthetics [5],

Table 3: Details and outcomes of 61 singleton pregnancies

Viability		Birth weight (kg)		Gender		1 Min Apgar		SCBU admission	
Live	**Stillborn**	**<2.5**	**>2.5**	**Male**	**Female**	**<7**	**>7**	**Yes**	**No**
59	2	16	45	40	21	5	56	11	50
(96.7)	(3.3)	(26.2)	(73.8)	(65.6)	(34.4)	(8.2)	(91.8)	(18)	(82)

Percentages are presented in parentheses

with obstetric cases simply listed as one of several types of patients transferred. Little specific research has been done into the degree to which the appropriate management of several types of patients transferred. Little specific research has been done into the degree to which the appropriate management of obstetric emergency referrals can influence neonatal and maternal outcomes. [6] To our knowledge through literature search, no studies of this kind have been identified in the Southeast Asian region.

Prior to this study, there was little or no information or data available in our local setting looking at inter-hospital emergency obstetric referrals. Therefore, the aims of our study were to examine these procedures and also to look at the maternal and perinatal outcomes of current standard operating procedures (SOP). As different hospitals have their own SOPs, we intended to see if there were any deficiencies with current existing SOPs. Currently, there is no guideline for inter-hospital transfer of obstetric emergency cases in our local setting. The use of a standardised guideline may improve overall outcomes.

The prevalence of inter-hospital transfer in our setting was 3.65% of total admissions to the labour ward during the study period. This differs from the 6.4% reported in Canada by Rourke and Kennard. [4] Differences in the prevalence of inter-hospital transfer reported may be influenced by demographic differences and practices of institutions between countries or regions. In our study, nearly 80% of the transfers were from Tutong (PMMPMHAMB) Hospital, an adjacent district approximately half an hour away by land transport. Although PMMPMHAMB Hospital has operating theatre facilities, cases that might require operative deliveries are usually transferred, due to lack of senior obstetric staff. Temburong (PIHM) Hospital has one labour room for normal deliveries and no theatre facilities for emergency LSCS. This explains the high percentage of referrals (15.2%) despite the small population size. On the other hand, JPMC (3.3%) and SSB Hospital (2.2%) are both equipped to deal with emergency obstetric procedures and only refer those patients in need of tertiary hospital care, preterm pregnancies and neonates in need of the special care baby unit.

The most common indications for transfers in our study included GHT, labour pain, suspicious CTG findings, reduced foetal movements and non-progressive labour or dystocia. Significant emergencies such as APH, PPH, GHT, pre-eclampsia, preterm labour or PPROM accounted for a smaller proportion. Less serious conditions that were also referred included anaemia in pregnancy requiring blood transfusion, early labour pain, pregnancy with vomiting and diarrhoea, pregnancy with musculoskeletal pain, pregnancy with ovarian cyst, and vaginitis during pregnancy. Fortunately, most acute asthma attacks are mild but can be serious and should be referred if indicated. Overall, there were discrepancies in almost a quarter of the cases between the reasons for referral and the final diagnosis. Most of these were referred from PMMPMHAMB Hospital.

According to the Australian Commission on Safety and Quality in Healthcare (ACQSHC), the most common scenario for inter-hospital transfer of obstetric patients is 'a patient in labour or bleeding or hyperten-

sive being identified as needing transfer to a higher level of care, sometimes but not always, in association with foetal immaturity'. [1] This need arises generally because of a local lack of facilities or of appropriate clinical skills. [2] The reasons for transfers are similar to our findings.

The time interval taken for inter-hospital transfers depends on the distance as well as the route taken. Although PMMPMHAMB Hospital is only located approximately 30 minutes away from RIPAS Hospital, one referred case only arrived three days after the referral date using her own transportation. This case was referred for suspected IUFD and in such cases, delay should be avoided. Proper explanations and provision of designated transportation by the referring hospital following internationally accepted guidelines would minimise any delay. Interestingly, the times taken for patient transfers were similar between JPMC and SSB Hospital despite a significant difference in distance between these two hospitals and RIPAS Hospital. The reasons for these were not immediately evident but may include delay in arrangements at many levels.

The modes of transportation are dependent on the locations, accessibility and availability of specially designated means of transport such as ambulance. Due to its inaccessible location, Temburong patients who require immediate obstetric interventions are transported by army helicopter while the less urgent cases are transported by boat or river ambulance. Importantly our study showed that the number of patients using their own vehicles or unaccompanied by any medical personnel or without referral letters, and even without prior phone contact to the obstetric on-call team by the medical officer from the referring hospital is of concern. It highlights major deficiencies and the need for standard guidelines which will facilitate an effective, efficient, and safe transfer of patients. Such standards have taken the form of practical regulations and guidelines in a variety of countries, including Australia [1, 9], Canada [10], Ireland and the United Kingdom. [5] In developing a guideline that is suitable for our local setting it important that we review various available guidelines or practices of other countries as there may be similarities and differences. Furthermore, the guideline is also dependent on the existing infrastructure and available resources.

Arranging an inter-hospital transfer from a small regional hospital is fraught with difficulties. Inter-hospital transfer itself can lead to significant associated morbidity and mortality especially if there are deficiencies. [7] In Australia, problems have arisen due to inadequacies in pre-transfer management of patients, delays in transfer, and inappropriate transfers. [1] Craig identified as contributors to these problems a lack of uniform policies regarding "system coordination, policy development, quality monitoring and assurance, education and data definition, collection and research". [1] Similar problems have been identified elsewhere in the USA [8], in the UK [3], in Taiwan [11], and in Canada. [4] Also there are differences in policies concerning the patients' escorts. Some systems include escorts from the referring hospitals while other have escorts from receiving hospitals. The level of expertise of escorts also varies. Most medical escorts were unsupervised junior trainees in anaesthetics, with little experience in trans-

fers and little suitable monitoring. [3] Such transfers could lead to a higher incidence of life-threatening complications. We emphasised the need for fully equipped, specialised transfer teams such as those commonly used in Australia, North America, and some European countries.

The use of dedicated centres to coordinate and monitor transfers is very beneficial and has been employed in some settings. [8] Transfers are processed through such centres, and bed allocations can be made depending on availability. However, in our local setting, given the small size of the country, a simple command centre in the tertiary hospital would be adequate.

In 2008 the ACSQHC presented a submission to the Australian Government with the aim of improving maternity services, and in particular a safety concern regarding maternal referral and transfer. [1] The Commission identified several risks associated with such transfer: incomplete information transfer between care givers or organisations which may not be noticed or remediated, delays in transfer and/or a rapid change in the patient's condition leading to delivery en-route and/or foetal death, a life-threatening change in maternal condition, and even cases where policy could impair or prevent frontline staff from making their own safety decisions and assessments in a pragmatic fashion. Problems encountered have led to the drafting of sets of laws, regulations, and guidelines in a variety of countries regarding inter-hospital transfer, including Canada [10], Australia [1, 9], the USA, and the UK. [5] These documents provide helpful practical recommendations, based on clinical experience, regarding the decision to transfer a patient; pre-transfer stabilisation; number and qualifications of personnel required to accompany the patient in accordance with the gravity of the patient's condition; monitoring, drugs and equipment to be used during transfer; suitability of vehicles for this use; documentation and handover; and appropriate post-transfer protocols. These sets of guidelines tend to reduce the burden for the hospital with the least resources, by means of a process of simplification of lines of communication and decision-making authority, and a clear management plan that would extend to the time after arrival, aimed at providing all carers with common therapeutic objectives and ensuring continuity of care. [7]

In conclusion, our study highlighted some deficiencies in the inter-hospitals referral and transfer process of obstetric emergences. The fact that, in the absence of suitable guidelines, there were no adverse maternal or perinatal outcomes during the period covered by the present study may be attributed more to good fortune than to design. It is very important that effective and efficient referral and transfer procedures are in place to minimise possible complications that may arise. As a result of our findings, we propose a set of recommendations that should be followed during referral and transfer of any obstetric emergencies (Table 4).

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Table 4: A proposed guideline for inter-hospital transfer of obstetric emergency cases.

1: Decision to transfer

- Appropriate indications or unavailable facilities to manage problem
- Decision must involve a senior and experienced clinician
- Appropriate arrangements must be in place
- The MO must contact the obstetric MO on call by phone prior to transfer

2: Stabilisation before and management during transfer

- Generally, the patient needs to be stabilised before transfer
- Adequate consultation and pre-transfer advice should be sought to optimise the treatment and stabilise the patient prior to transfer
- The airway may need to be secured in patients with eclampsia
- Appropriate venous access must be in place (especially in obstetric haemorrhage such as APH and PPH- blood grouping and cross matching, and blood transfusion should be arranged and initiated by the referring hospital before transfer)
- Monitoring must be instituted at all times
- Appropriate treatment for severe pre-eclampsia and eclampsia (antihypertensive and magnesium sulphate) should be available and dexamethasone therapy for preterm labour and PPROM, should not be delayed while waiting for the transfer.
- Those obstetric cases that might need emergency caesarean section should have informed consent taken by the referring MO to facilitate the process of emergency operation on arrival at the tertiary centre

3: Patient escorts

- The precise requirement of patient escort will depend upon the clinical circumstances in each case but must be able to manage any problems
- A critically ill patient should be accompanied by a minimum of two escorts
- Patients should be accompanied by a MO and/or nursing personnel or midwife experienced in obstetric patient transport
- A senior doctor should take the decision on who should accompany the patient and the referring hospital should arrange for the accompanying medical personnel

4: Transport vehicles

- The transport vehicles should be adequately equipped, preferably dedicated to patient transport, not multi-role
- With the exception of Temburong where helicopter is used for emergencies, ambulance is the preferred mode of transportation.
- Non urgent cases from Temburong can be transferred by boat.

5: Monitoring, drugs and equipment

- There should be an adequate supply of medical equipment, medications and consumables for each transfer
- Requirements should take into account the duration of the journey and the nature of the obstetric condition
- The accompanying medical personnel from the referring hospital should be responsible for ensuring that appropriate and sufficient equipment is available
- Basic aids for monitoring of vital signs (pulse rate, blood pressure, temperature and respiratory rate) should be available
- Patients receiving continuous drug infusion during transfer should have automated intravenous drug infusion pumps available to ensure accurate rates of administration

Continued ⟶

Continued

6: **Communication**

Good communication is the key to success

The MO from the referring hospital must contact the on call obstetric MO of RIPAS Hospital by phone before any inter-hospital transfer

All necessary information regarding patients should be given (reason for transfer, general condition and vital signs of the patients, condition of the foetus including gestation age and CTG, the stage of labour for intrapartum transfer, and medication given to the patient)

The obstetric on call team should give necessary advice regarding management or treatment that should be given to the patient prior to transfer

The referring MO should be asked to provide the estimated time of arrival at RIPAS Hospital

The obstetric MO must inform the following on call people: in-charge Staff Nurse, Senior MO, Specialist Obstetrician, theatre staff, anaesthetist, paediatrician and SCBU depending on the nature of obstetric emergency referral cases

7: Specific principles

For obstetric patient transfer, foetal heart rate monitoring should be available during all phases of transport either by intermittent auscultation, intermittent Doppler or continuous Doppler methods

Attendants should be capable of handling delivery during transfer and other anticipated complications

There should be adequate neonatal resuscitation equipment available at all stages during transfer

8: Documentation and handover

Assessment and treatment of patients before and during transfer should be clearly documented

Adequate clinical notes should be forwarded with the patient to the receiving hospital as well as relevant radiographs, pathology specimens and reports (If necessary, copies should be made and sent)

Referral letters must be made available and forwarded with the patient

Accompanying medical personnel should provide a proper handover to the on call Obstetric MO and/or labour ward in-charge at the receiving hospital together with referral letter, patient's clinical notes, necessary documents, treatment charts and monitoring charts.

9: Review and Quality assurance

Implementation of Guidelines for inter-hospital obstetric emergency transfer should be audited periodically to improve the system

Note: The proposed guideline was formulated by group consensus among researchers. This study and proposed guideline were presented to the Obstetric and Gynaecology Departmental CME and amendments were made to obtain general agreement and consensus.