RECOMMENDATIONS FOR A MAXIMUM SURGICAL BLOOD ORDERING SCHEDULE IN OBSTETRICS AND GYNAECOLOGY

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SYNOPSIS

A prospective study of 1570 requests for 3,369 units of cross matched blood was undertaken for ten days each in February and March 1983, to assess the relative importance of the indications for requesting blood. The relation between quantities of blood ordered as cover for operative procedures and for patients under observation to the actual quantity of blood utilised in these cases at the Kandang Kerbau Hospital for women was found to be far in excess. The feasibility of a "group and screen scheme" without detriment to patient safety is analysed. The results revealed that in 75% of cases blood need not be grouped and cross matched because only 2% of this group will in effect need rapidly cross matched blood. The chances of encountering an abnormal antibody in this group will be 4.6 patients per year in K K Hospital. In such a circumstance there is good chance of getting compatible blood with a rapid cross match test, and the facilities for such practice in Kandang Kerbau Hospital, is adequate.

INTRODUCTION

Blood ordering practices are influenced, by the condition of the patient for whom blood is needed for transfusion, as cover for an operation or for a patient under observation. Though this should be the case, the habit and belief of the surgeon, surgical houseman and the anaesthetist play a major role in the number of requests and the quantity that is requested. Careful appraisal of the transfusion requirements for each procedure or diagnosis allows a 'maximum surgical blood ordering schedule' and to minimise unnecessary crossmatching (1). Although such schedules have been worked out by Friedman et al (2), Rouault and Gruenhagen (3) and Friedman (4), it applies only to their context, the patient's general condition, surgeons experience and the definitive procedures undertaken by each surgeon. It is important to work out such schedules from our local experience. This has been done by analysing the 1570 requests made to the blood transfusion unit at the Kandang Kerbau Hospital.

It is ethically important to give cover for patients even with a minimum risk. The feasiblity of this by a "group and screen policy" and when required to give compatible blood by a rapid cross match test has been analysed. Considering the requests for cross match and the presence of abnormal antibodies in 1980, 1981 and 1982, the possibility of encountering a patient in the group and screen scheme with abnormal antibodies needing blood after a cross match test has been studied. The reliability and safety of rapid cross match test has been discussed by reviewing the literature and by a of rapid and full cross match tests in those patients with abnormal antibodies. Analysis of the blood available in the hospital to provide such services were viewed in the context of the general ABO and Rh group distribution in our local population (5).

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METHODS

The 1570 requests were grouped into Obstetrics and Gynaecology. Each of these were subdivided into three further groups. Gynaecology operations, where it was felt that transfusion was likely, were grouped as major cases; the cases where transfusion may be needed rarely were grouped as intermediate; and those procedures which may need transfusion in exceptional circumstances were classed as minor.

The grouping took into consideration the absence of other complicating factors and the absence of anaemia as mentioned in the request form. (Table I). The common operations were grouped into minor, intermediate and major on the lines recommended by Mintz et al (6), Friedman et al (4).

In Obstetrics, the cases which were likely to bleed or to have operative intervention were considered as major, needing cross matched blood; those where operative intervention is more likely later were considered as intermediate group needing a group and screen procedure; and cases not in labour with no complications needing interference or those in normal labour where no problems were anticipated were classed as minor; needing no blood for group and screen. (Table II). Prospective studies were carried out to find the number of patients who needed blood in each group.

Analysis of 84,243 cases revealed the incidence of abnormal antibodies of 1.10% in our patient population, who would face problems in having compatible blood for transfusion. (Table III). The types of abnormal antibodies were studied in detail with the number of cross match test done in each group to obtain compatible blood (Table IV). The quantity of blood available in the blood bank, to provide such services was studied considering the prevalence of the ABO and Rh group in our population. (Table V).

A prospective study of the sensitivity of detecting abnormal antibodies by a 15 minute rapid cross match test in those patients with abnormal antibodies was compared to the results obtained in the same samples after a full cross match test at the end of one hour. (Table VI).

RESULTS

The total requests were 1570, for 3,369 units of blood. In obstetrics there were 933 (59.4%) requests for 1,853 (55%) units of blood and in gynaecology there were 637 (40.6%) requests for 1,516 (45%) units of blood.

TABLE I.
THE REQUESTS IN GYNAECOLOGY CATEGORISED AS MAJOR, INTERMEDIATE AND MINOR.

Gynaecological Operations	No of Patients	No of units requested	Patients needing blood No	%	Quantity of blood transfused No	%	C.T (ratio)
Minor ? Need for group and screen	460	928	7	1.5%	17	1.8%	54.6:1
Intermediate Group and screen	36	83	1	2.8%	1	1.2%	83:1
Major Cross Match	141	505	42	29.8%	67	13.3%	7.5:1
Total	637	1516	50	7.8%	85	5.6%	17.8:1

Examples classed as minor were, suction termination of pregnancy, sterilisation, Dilatation and curettage, Midtrimester pregnancy termination; Infertility investigations, Marsupialisation etc. Examples classed as intermediate were pelvic floor repair, cone biopsy of cervix, ventrosuspension, staging operations etc. Examples classed as major were Wertheims operation, Laparotomy, abdominal or vaginal hysterectomy, sex reassignment operations, Ectopic pregnancies, ovarian cystectomies, myomectomies and any operation on an anaemic or ill patient.

TABLE II.
THE REQUESTS IN OBSTETRICS CLASSIFIED AS CASES WHO NEED CROSS MATCH (MAJOR), CASES WHO NEED GROUP AND SCREEN (INTERMEDIATE) and CASES WHO DO NOT NEED GROUP AND SCREEN (MINOR).

Gynaecological Operations	No of Patients	No of units requested	Patients needing blood No	%	Quantity of blood transfused No	%	C.T. (ratio)
Minor ? Need for group and screen	548	958	13	2.4%	20	2.1%	47.9:1
Intermediate Group and screen	126	260	3	2.3%	7	2.7%	37.6:1
Major Cross Match	257	632	31	12.1%	79	12.5%	8:1
Total	933	1853	47	5.0%	106	5.7%	17.5:1

Examples of cases that would not need group and screen were surgical induction for mild PE, border line GTT, prolonged pregnancy, static weight at term, normal labour with no complications or problems like slight oedoema, slightly shorter than average height and preterm labour where operative delivery was not contemplated.

Examples of patients who need group and screen were those who may need operative delivery, like poor progress in augmented, induced or stimulated labour, or patients with no liquor, light meconium stained liquor, or short statured patients and those with previous history of forceps delivery and grandmultipara.

The patients needing cross match were antepartum haemorrhage of any origin, blood stained, moderate or thick meconium stained liquor, fetal distress, previous caesarean section in labour, all cases needing caesarean section or operative delivery, present or past history of retained placenta and/or postpartum haemorrhage, abnormal presentation and lies, multiple pregnancies and cases of anaemias.

The incidence of abnormal antibodies found in our patient population which will reduce the chance of getting compatible blood are shown in Table III,

TABLE III.
THE NUMBER OF REQUESTS, AND THE INCIDENCE OF ABNORMAL ANTIBODIES IN 1980, 1981 AND 1982.

Year	Number of Requests	Presence of abnormal antibodies	
1980	26,436	326	1.23%
1981	28,667	319	1.11%
1982	29,140	282	0.97%
Total	84,243	927	1.10%

The various types of antibodies encountered, the quantity cross matched in each type and the number of units which were found to be compatible are given in Table IV. One in every 2.7 units of blood cross matched was compatible in an abnormal antibody situation excepting the very exceptional cases.

TABLE IV
THE DIFFERENT TYPES OF ABNORMAL ANTIBODIES, THE QUANTITY OF BLOOD CROSS MATCHED FOR EACH TYPE AND THE NUMBER OF UNITS FOUND COMPATIBLE-YEAR (1982).

Abnormal Antibodies	No of cases	No cross matched	No compatible	%
Unidentified ab	31	305	106	34.8%
Rh	18	135	62	45.9%
Anti Le^a and Le^b	55	443	135	30.5%
Anti P_1	44	358	193	53.9%
Anti Le^a	37	318	135	42.5%
Anti Leb	29	207	94	45.4%
Anti I	31	284	79	27.8%
Others	18	259	52	20.1%
Total	263	2309	856	37.1%

Table V shows the quantity of blood usually reserved in the blood bank and the prevalence of the ABO group system in our population, indicating that there was adequate blood reserve should we encounter such an abnormal antibody problem. This ABO group distribution was based on the study of 68,693 patients by Loh S Y, Yang C S, and Ong Y W (1976). (5) The same study showed the prevalence of Rhesus negative group to be 0.25% in Chinese, 0.28% in Malays and 5.78% in Indians.

TABLE V
THE PREVALENCE OF ABO GROUP SYSTEM IN OUR POPULATION AND QUANTITY OF BLOOD AVAILABLE IN EACH CATEGORY IN OUR BLOOD BANK.

Groups	A	B	AB	O
Prevalence in our population	26.4%	24.5%	5.8%	43.3%
Quantity of blood available	45 26.8%	45 26.8%	13 7.7%	65 38.7%

The safety with which the rapid cross match test will pick up those cases with abnormal antibodies were studied by doing a rapid cross match test at 15 minutes followed by a full cross match test at one hour with the same donor cells (Table VI). It showed that 94.6% of such cases were picked up with a rapid cross match test.

TABLE VI
THE RESULT OF RAPID AND FULL CROSS MATCH TESTS IN CASES WITH ABNORMAL ANTIBODIES

Recepient with abnormal antibodies	Positive Reaction seen on rapid cross match test (AHG)		Positive Reaction not seen on rapid cross match test (AHG)		Percentage correlation
56	53	94.6%	3	5.4%	94.6%

DISCUSSION

The blood cross match to transfusion ratio of 2.5:1 was suggested to be realistic and economic by Rouault and Gruenhagen (3). Gillan Penny et al (1) considered a ratio of 5.7:1 in an obstetrics and gynaecological practice to be over ordering. The analysis of the 1570 requests in our study gave a C.T. ratio of 17.6:1. This was interpreted in the local context taking into consideration the prevalence of anaemia and the surgical practices along with the condition for which blood was requested. The requests were basically classified into three groups based on the recommendations of Mintz et al (6) to find the need for crossmatching in each group. If the cases in the major category in obstetrics and gynaecology were considered for cross matching while the intermediate and minor categories for group and screen, there could have been 398 (25.4%) requests for cross match and 1172 (74.6%) requests for group and screen. In the major category, of the 398 patients 73 (18.3%) needed blood and had a C.T. ratio of 7.8:1. In the intermediate and minor category, of the 1172 (74.6%) patients 24 (2%) patients needed blood (C.T. ratio of 49.6:1). Considering the 24 (2%) patients who needed blood the chance of them having an abnormal antibody with difficulty in getting compatible blood would be 0.26 (1.1% of 24). This would work out to one patient with abnormal antibodies requiring rapidly cross matched blood out of 6038 requests. Considering this to the requests over 1980, 1981 and 1982, there would be 28,081 requests for blood per year and the chance of encountering patients with an abnormal antibody needing a rapid cross matched blood would be 4.6 patients per year. Blood would be easily found for these 4.6 patients as one in 2.7 units would be compatible even with the presence of abnormal antibodies. (Ref. Table IV)

Although cross matching is the widely acceptable form of compatibility test, Borall and Henry (7) have shown that the transfusion of homologous blood after a recipients serum has been checked for unusual antibodies by a group and screen procedure is 99.9% safe. The issue of a card stating the ABO, Rh groups and any abnormal antibodies present, to patients (and donors) would facilitate the search for compatible blood in emergency and elective situations.

The factor of safety in rapid cross match in cases with antibodies were studied, by reading the tests with abnormal antibodies at 15 minutes and at 1 hour (Table VI). This showed that 94.6% were picked up at 15 minutes, and those which did not show any reactions were those with weak antibodies thus taking more time to reveal it's incompatibility. This percentage correlation would be enhanced to 100% by adopting a group and screen policy and by performing a full cross match in those cases where abnormal antibodies were detected. According to French (8) 97% of sera tested when undiluted gave a positive indirect antiglobulin test after 15 minutes incubation. He concluded that 15 minutes incubation suffices to detect all but the weakest blood group antibodies. This was further confirmed by Stroup and MacIlroy (9) who found no loss of sensitivity of the antiglobulin test with a 15 minutes test provided the test cells were suspended in bovine albumen. Although it might not seem serious to fail to detect weak antibodies, there is always the possibility that transfusion may stimulate an anamnestic response resulting in delayed haemolytic transfusion reactions. This could be reduced to a minimum, by reading the test as late as possible and by using undiluted sera, when more antibodies are taken up by red cells (10). If the clinician responsible for the patient would alert the laboratory, his urgency, the laboratory staff could give the maximum time for incubation thus reducing the chance of incompatibility to a minimum.

We have studied the feasibility of a maximum surgical blood ordering schedule at our hospital by examining the actual blood transfusion for the common procedures and for patients under observation as recommended by Bear and Friedman (11) and Gillan C. Penney (1). During our study period the cross match to transfusion ratio was 17.6:1 which was far in excess of 2.5:1 recommended by Renault and Gruenhagen (3). On detailed analysis the intermediate and minor indications revealed a cross match to transfusion ratio of 49.6:1 whereas the cases indicated as major had a C.T. ratio of 7.8:1. According to our classification for Obstetrics and Gynaecology we have recommended a group and screen policy for those with a higher cross match to transfusion ratio (Minors and Intermediates) and a group and crossmatch for patients with lower cross match to transfusion ratio (Majors).

By such a policy we believe that there will be a reduction in outdating of blood, a reduction in cost to the patient and reduction in unnecessary cross matching by 75%. Patten and Alperin (12) in a similar study in Texas has shown a 42% drop in outdating of blood and that only 2.3% of the cases who had a request for group and screen actually needed blood. This policy would not be detrimental to the patient safety. The risk

associated with the rapid cross match test would be minimised by the group and screen policy. The search for compatible blood could be further facilitated by issuing patients with cards denoting their group, Rh and antibody status. The blood ordering in Obstetrics and Gynaecology is largely governed by existing clinical practice. The introdution of a group and screen procedure will further improve and rationalise blood ordering practices which will contribute to the optimal utilization of a unique therapeutic resource the donated blood.

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