DETECTION OF HIGH RISK PREGNANCY — A SIMPLE SCORING SYSTEM

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SUMMARY

Risk scoring systems have been tabulated from time to time to pinpoint patients and risk for adverse obstetrical and perinatal outcome. A simple scoring system using 10 ante and intranatal factors was evolved which is easy to administer, simple to follow and reliable in categorising pregnant women into low or high risk groups for proper care. The system involves easily avilable information like history, clinical findings etc. and not sophisticated investigations which are too expsensive for developing countries like ours.

Introduction

During the last two decades, there is a gradual shift of attention in obstetrics from maternal mortality and morbidity problems to those affecting the newborn. The improved perinatal care has been possible due to recent advances and collaborative efforts of various specialities like obstetrics, neonatology, anaesthesia, neonatal pathology, etc. The common goal is to maximise the quality of fetal and neonatal life in addition to maternal well-being. In a country like ours with scanty resources it is essential that extra care be provided to only those who deserve it most. This can be done by early identification of risk factor and timely referral to a regional or teaching hospital by the use of a numerical scoring system. Risk scoring can be defined as a formalised method of recognising, documenting and cumulating antenatal, intranatal factors to identify high risk pregnancy and predict complications for the mother, fetus and infant. From time to time, various semi-objective risk scoring systems have been developed in western countries and of late in India, but majority of them are too complicated and difficult to follow in a busy hospital. The present study was aimed at developing a risk scoring system which is simple, effective and reliable in detecting "At risk" cases. The scoring involves easily available information like history, clinical findings, etc. and not sophisticated investigations which are too expensive for a developing country like ours.

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Material and Methods

As shown in Table I, common risk factors which are easily available are se-

TABLE - I
SIMPLE RISK SCORING SYSTEM

Risk Factor	*Score* 0	1	2
Age	20 - 34	<=19/>=35	–
Parity	2 - 4	<=1	>=5
Height	>=145 cms.	<145 cms	–
Weight	40 - 90 kgs.	<=40 kg. >=90 kg.	
Obstetric History	–	Obst. loss (1,2) LBW/Neonatal Morbidity and Mortality	Habitual Obst. loss (>=3)
Medical Complications (Past & Present)	–	Mild P.I.H. Mild Anaemia	Severe P.I.H. Severe anaemia Heart disease
Presentation & Position, Lye	O.A.	O.P.	Breech, Brow Face, Transverse
Gestational age	36-40 weeks	32 -36 weeks 40 - 42 weeks	< 32 weeks > 42 weeks
Obstetric Complications AN/IN	–	PROM unbooked	APH, I tri. bleeding, ut. size discre.
Labour problems	–	Mild foetal distress	Prolonged labour (>=20 hrs.) Ppt. labour < = 3 hrs. severe foetal distress

Score > = 3 ——> High Risk

lected. According to the severity of the factor, appropriate score (0,1,2) is alloted. Total score of 3 or more than 3 is considered as high risk. Scoring is done at the first antenatal visit, 28 weeks, 36 weeks and at the time of labour room admission. The selection of the cases was at random and scoring in no way affected the obstetric acumen or decision making. The outcome as regards birthweight, maturity, perinatal loss, obstetric outcome etc. were co-related with the score.

Observations and Results

Out of the 1500 cases who were scored 499 (33.3%) were at risk i.e. score of 3 or above and 1001 cases were at no risk, i.e. with a score 0,1,2.

Incidence of Preterm Delivery and Risk Score

Out of 200 preterm deliveries, 157 (78.5%) were of the total score of 3 and above. Only 43 (21.5%) were of the score 0,1,2. False negative rate i.e. reported as low risk by the scoring system but delivering as a preterm, was only 4.29%. The ability to detect preterm delivery was 78.5%.

Birthweight and Risk Score

Table II shows distribution of birthweights and the risk score. Ability to detect low birthweight below 2000 gms. was 64.8%. Here too the false negative rate was very low (8.29%). There was an inversely proportional co-relation between score and birthweight with co-relation coefficient at 0.6 and $p<0.5$.

Obstetric Interference and Risk Score (Table III)

Incidence of interference like induction, vacuum, forceps, LSCS was 78.8% when the total score was 3 or above. The false negative rate i.e. obstetric interference inspite of low score was only 4.3%.

TABLE - II
DISTRIBUTION OF BIRTHWEIGHT AND RISK SCORE

Risk Score	*Birthweight*			
	<2000	*2000-2250*	*2250-2500*	*>2500*
0	23 (9.7%)	73 (19.3%)	221 (55.5%)	345 (70.5%)
1	39 (16.5%)	29 (7.6%)	53 (13.3%)	90 (18.4%)
2	21 (8.8%)	43 (11.4%)	35 (8.7%)	29 (5.9%)
3	68 (28.8%)	103 (27.3%)	30 (7.5%)	6 (1.2%)
>3	85 (36.0%)	129 (34.2%)	59 (14.8%)	19 (3.8%)
1500	236	377	398	489

Ability to detect LBW <20000 = 65%
False -ve Rate = 8.29%, $p < 0.05$

TABLE - III
INCIDENCE OF OBST. INTERFERENCE/COMPLICATIONS

Risk Score	*Induction*	*Forceps*	*Vacuum*	*LSCS*	*Obstetric Comp's.*
0	3 (6.6%)	–	–	–	–
1	7 (15.5%)	3 (5.7%)	1 (4.7%)	2 (4.8%)	–
2	1 (2.2%)	9 (17.3%)	3 (14.2%)	6 (14.6%)	8 (18.1%)
3	19 (42.2%)	17 (32.6%)	5 (23.8%)	12 (29.2%)	19 (43%)
>3	15 (33.3%)	23 (44.2%)	12 (57.1%)	21 (51.2%)	17 (38.6%)
	45	52	21	41	44

Ability to detect Obst. Int. = 78.8%
False -ve 4.3% $p < 0.4$

***Stillbirths/Neonatal Deaths and Risk Score** (Table IV)*

The incidence of stillbirths/neonatal deaths also showed similar pattern. The ability to detect stillbirths and neonatal deaths was 72.9% and 71.4% respectively.

TABLE - IV
INCIDENCE OF STILLBIRTHS/NEONATAL DEATHS & MALFORMATIONS

Risk Score	*SB*	*ND*	*Malform.*
0	3 (8.1%)	2 (7.1%)	3 (2.7%)
1	2 (5.4%)	3 (10.7%)	2 (1.8%)
2	6 (16.2%)	3 (10.7%)	3 (2.7%)
3	10 (27.0%)	8 (28.5%)	1 (9.0%)
>3	17 (45.9%)	12 (42.8%)	2 (1.8%)
Ability to detect	SB = 72.4%	False -ve = 1.09%	
	ND = 71.4%	False -ve = 0.79%	

For detecting all this eventualities i.e. preterm delivery, low birthweight, perinatal deaths and obstetric interference the scoring system gave very good results with false negative rate sensitivity of approximately 4% and detection ability of 75%. However false positive rate specificity i.e. reporting high risk but having normal outcome was a bit high (25%) in most parameters. We feel it should be the sensitivity i.e. the false negative rate that is more important because delay in refering a high risk case is much worse then refering a low risk patient as a high risk case (false positive i.e. specificity). In comparison to other Indian and Western scoring systems (Table V), ours is easy to administer, simple to follow, and reliable in categorising pregnant women into low or high risk groups for proper care. Such a strategy can help in early identification of high risk pregnancy, timely referal to regional centres, better care, reduction of perinatal mortality and morbidity and is especially useful in our country where resources are scanty.

Discussion

Objective scoring system for the detection of high risk pregnancy form an important part of "high risk" strategy. This standardises the degree of risk avoiding individual variations in the risk assessment. Rather than a single risk factor, it is the combination of various risk factors that significantly increase the risk (Hobel, 1973, 1979). The number of risk factors involved in Hobel's scoring chart were so high that it is practically impossible to use it in a busy teaching hospital like ours. It is still more cumbersome to use it in Primary Health Centres and peripheral maternity homes by paramedical staff. In the present study, we have evolved a simple risk scoring system using only 10 ante and intranatal factors which are easily elicited. For simplifying the system, further weightage given to each factor is limited to 0,1,2. A score of 3 is taken as cut out score for labelling the case "high risk". According to our system scoring begins in the antenatal clinic or even in pre-pregnancy period. As the pregnancy advances, scores are added and whenever score becomes

more than or equal to 3, patients are labelled as "high risk". Similar systems have been developed, by other Indian authors, e.g. Bhargava et. al. (1982), Gopalan et. al (1982), Jayam et. al. (1984). All of them have more than 20 risk factors. While important factors like pregnancy induced hypertension, other medical complications are omitted (Table V), our simple scoring system has low false negative rate (4%) i.e. sensitivity. While false positive rate was 25% i.e. specificity we feel that sensivity is more important than specificity for scoring system as delay in referal of high risk cases is worse than diagnosing low risk cases as high risk. This study proposes a risk scoring system which is simple, effective and reliable in detecting high risk pregnancy, from easily available information like clinical findings and history taking etc. and not sophisticated investigations which are too expensive for a developing country like ours. Such a strategy can help reduce perinatal mortality and morbidity as well as maternal morbidity by early identification and timely referal of high risk cases by inexpensive means.

References

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TABLE - V
COMPARISON WITH OTHER SCORING SYSTEMS

No.	*Sample scoring system*	*Hobells/Nesbit's*	*Bhargava et. al Gopalan et. al*
1.	Simple & Easy	Difficult & Complicated	Simple & Easy
2.	Prenatal + Intra (P.I.H. omitted)	Prenatal + Intra	Only Prenatal
3.	Only 10 items	95 items	–
4.	Weights easy to count	Weights difficult to count	Easy to count
5.	False -ve Rate Low (Sensitivity up)	False -ve Rate low. Sensitivity up	False -ve Rate low. Sensitivity up
6.	False -ve Rate Low (specificity down)	False +ve Rate low.(Specificity up)	False +ve Rate high. (Specificity down)
7.	Identification Ability. Good	I. Ability Very Good	I. Ability Moderate