Survival pattern among extreme preterm infants

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ABSTRACT

Objective: To look at the survival pattern of extreme preterm Omani infants (23-26 weeks gestation) and compare it with the western countries.

Methods: All extreme preterm Omani infants (gestational age of 23 to 26 weeks) admitted from November 1991 to February 1998 at the Neonatal Intensive Care Unit of Sultan Qaboos University Hospital were reviewed. The detailed records of the infants, including name of mother, age, gravidity, parity, route of delivery, Apgar score, time of birth, inborn or outborn, birth weight, gestational age, sex, need for resuscitation, course in the Neonatal Intensive Care Unit, admission and discharge diagnosis, and outcome were collected from the register. The infants were stratified according to the gestational age and then analyzed for the survival rate among the different gestational ages.

Results: A total of 32 extreme preterm infants were admitted to the Neonatal Intensive Care Unit of Sultan Qaboos University Hospital from November 1991 to February 1998. The mean birth weight of the cohort was noted to be 798±123 gram (Range 480-1015 grams). The mean gestational age was noted to be 25.5±0.95 weeks (Range 23-26 weeks). An equal number of males and females were noted in the cohort, with male to female ratio of 1:1. A total of 13 infants survived out of 32 infants. The overall survival rate for the cohort was noted to be 41%. For the present study, the western statistics are averaged and than compared with the Omani statistics. The survival rate for western 26 week preterm infants was (on average) 61% as compared to 44% among Omani preterm infants. The same trend of low survival was noted for 23 and 24 week Omani infants, except for only one 25 week infant.

Conclusions: The significant lower survival rate suggests the need for more attention and improvement in the management and care provided to the extreme preterm Omani infants.

Keywords: Survival, extreme preterm, infants.

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With the advent of surfactant therapy, better pharmacological management of preterm labor and extensive neonatal resuscitation, the survival of extreme preterm infants has increased in western countries.[1-7] But this increased survival has resulted in increased morbidity, especially in terms of neurodevelopmental disabilities.[8-10] Resuscitation of an extreme preterm infant and providing full intensive care has been a matter of debate and concern in developing countries especially due to financial and technical restrains. We conducted an audit on the survival pattern of extreme preterm Omani infants and compared it with that of western statistics. The main aim of the study was to look at where Oman stands with the care of extreme preterm infants in comparison to the west. This study is the first of its kind reporting the mortality pattern on extreme preterm infants from this region of the world.

Methods. The Neonatal intensive care unit (NICU) at Sultan Qaboos University Hospital (SQUH), Oman, was inaugurated in November 1991

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and since then it has been working as a tertiary care center. Our NICU caters for all sick neonates, including extreme preterm infants, both born in our hospital and referred from peripheral hospitals. The detailed records of the infants, including name of mother, age, gravidity, parity, route of delivery, Apgar score, time of birth, inborn or outborn, birth weight, gestational age, sex, need for resuscitation, course in the NICU, admission and discharge diagnosis, outcome and follow up plan were kept in the NICU admission register. The data was collected from the register. All extreme preterm infants (gestational age of 23 to 26 weeks) admitted from November 1991 to February 1998 at the NICU of SQUH were reviewed. The data was collected with respect to birth weight, sex, and occurrence of mortality. The patients were stratified according to the gestational age. The distribution of patients is shown in Figure 1. After data collection, the data was analyzed for the survival rate among the extreme preterm infants.

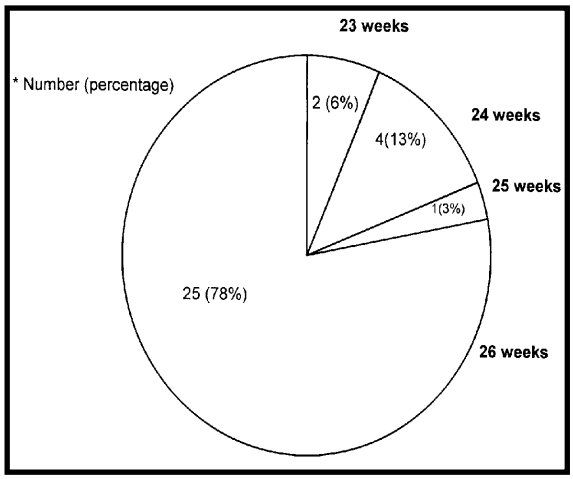

Figure 1 - Distribution of extreme preterm infants.

Results. A total of 32 extreme preterm infants were admitted to the NICU of SQUH from November 1991 to February 1998. The mean birth weight of the cohort was noted to be 798±123 grams (Range 480-1015 grams). The mean gestational age was noted to be 25.5±0.95 weeks (Range 23-26 weeks). An equal number of males and females were noted in the cohort, with a male to female ratio of 1:1. A total of 13 infants survived out of 32 infants. The overall survival rate for the cohort was noted to be 41%. The comparative data for the survival of extreme preterm infants at SQUH and the previous western studies is shown in Table 1. For the present study, the western statistics are averaged and than compared with the Omani statistics. The survival rate for western 26 week preterm infants was (on average) 61% as compared to 44% among Omani preterm infants. The same trend of low survival was noted for 23 and 24 weeks Omani infants, with the exception of only one 25 week infant (See Table 1).

Discussion. We note low survival among the extreme preterm Omani infants as compared to western reports. However the trend of increased survival with increased gestational age is comparable to those western reports.[1-7] We note that most of our infants (78%) are in the subgroup of 26 weeks and the survival rate is 44%, which is less than the western reports. We had only one infant with the gestational age of 25 weeks and he survived, so we achieved 100% survival for this subgroup, which may not be the real reflection of the population. None of the infants with a gestational age of 23 weeks survived in our cohort.

As a pediatrician, we are not only interested in the survival pattern for extreme preterm infants but also on the long-term outcome. Previous studies from the west have reported an inverse relationship between the gestational age and morbidity among extreme

Table 1 - Neonatal survival data from 23-26 weeks from 1985, and comparison with the Sultan Qaboos University Hospital cohort.

Place	Year of birth	23 weeks	24 weeks	25 weeks	26 weeks	Reference
Baltimore, Maryland, USA	1988-1991	2/28 (7)	19/34 (56)	31/39 (79)		Allen et al[1]
Chapel Hill, North Carolina, USA	1989-1991	0/21 (0)	5/11 (46)	14/22 (64)	18/25 (72)	Katz and Bose[2]
Detroit, Michigan, USA	1988-1991	2/28 (7)	13/40 (32)	11/44 (25)	35/62 (56)	Holtrop et al[3]
Minneapolis, Minnesota, USA	1986-1990	12/32 (37)	28/75 (37)	54/90 (60)	72/113 (64)	Ferrara et al[4]
Western Australia	1990-1991	3/15 (20)	8/18 (44)	14/22 (64)	27/40 (68)	Hagan et al[5]
Trent Region, UK	1991-1993	1/37 (3)	27/97 (28)	38/104 (36)	73/132 (55)	Bohin et al[6]
Cambridge, UK	1985-1992	1/9 (22)	13/28 (45)	26/55 (47)	43/80 (54)	Rennie[7]
SQUH	1991-1998	0/2 (0)	1/4 (25)	1/1 (100)	11/25 (44)	

SQUH - Sultan Qaboos University Hospital
Values are given as n/total (%)

preterm infants.[8-10] An increased incidence of neurodevelopmental disabilities and handicap has been contemplated for the long term outcome of extremely preterm infants. In our study, as most of the infants were lost to follow up due to various inevitable reasons, such an outcome was not available to indicate a better picture of the morbidity among the surviving extreme preterm Omani infants.

Looking at the data, our study clearly highlights the point that further improvement is needed in care of extreme preterm infants in Oman to catch up with the western standards. But in a practical sense this is not so easy. It remains a matter of ethical controversy in developing countries about how far and how much should be carried out for these extreme preterm infants, mainly because of restrictive resources. Without knowing the exact morbidity and neurological outcome of these extreme preterm infants, it is difficult to decide ethically on the issue of resuscitation of extreme preterm infants in our setup as compared to the west, where debate is going on, on the issue of whether to resuscitate or not to resuscitate.[11] Good obstetric care with appropriate and timely treatment of preterm labor, prevention of preterm delivery and involving neonatologist and parents in decision making for the resuscitation, remain the mainstay of management of extreme preterm infants in our setup. Cultural background and religious beliefs may also interfere with the process of decision making and should be taken into account before coming to any final conclusion.

In conclusion, the survival rate of extreme preterm Omani infants was lower than the western reports, suggesting the need for improvement. Further studies are needed to look at the morbidity pattern and neurodevelopmental outcome of such infants. The provision of full intensive care to these infants may change the survival pattern. Resource utilization, chronic morbidity, cultural background and religious beliefs have to be taken into account before any firm decision can made regarding the issue of resuscitation and provision of full intensive care support to these extreme preterm infants in Oman.

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