Perinatal care of multiples

M.R.G. Carrapato

Abstract

Careless and uncontrolled assisted reproduction techniques has led to an "epidemic" of higher order pregnancies. This paper discusses some of the problems regarding multiplicity per se for the mother and the fetus/neonate, the surrounding controversies from antenatal corticosteroids for multiples, to the mode of delivery and comparing the immediate outcome of spontaneous occurring to "iatrogenic"induced multiples. The offspring middle/long term outcome emphasises not only the psychomotor,neurosensory and behavioural sequela but,also the potential for the late development of the metabolic syndrome of obesity, insulin-resistance, cardiovascular and related disorders.

Key words: multiplicity, controversies, outcome

In the not-so-distant past the irrational and reckless use of assisted reproduction techniques (ART) led to the overwhelming occurrence of multiple pregnancy with its inevitable toll of medical, ethical and social burdens. Fortunately at present, good practices are being implemented, both by the medical community as well as, in some countries, by the legislators. However, in many places the problems of uncontrolled ART remain with the worrying perspectives of higher order pregnancy occurring indiscriminately, sometimes with epidemic proportions. There are many questions for debate but, in essence, there are three inter-related fundamental issues: 1) Multiplicity per se. 2) The surrounding controversies. 3) The immediate and late outcome of the offspring.

Multiplicity

It is primarily and immediately responsible for maternal, fetal and peri(neonatal mortality and/or morbidity. The list of problems and complications is substantial (Table 1), and considerably more could still be added.

With the exception of some specific multiple pregnancy disorders, from placentation to chorionicity, fetal-fetal transfusion syndrome (FFTS) and the "vanishing" twin, all other conditions may occur in single pregnancies but are, nevertheless, much more frequent in higher order pregnancies. In fact, either in isolation or in association, all these unfavourable factors will concur for the overall bad prognosis of twins, triplets and more.

The controversies

There are, certainly, many other controversial issues regarding multiple pregnancy but for the purpose of this presentation focus will be placed (Table 2) on those ongoing and unresolved major topics in everyday clinical approach, namely:

Antenatal corticosteroids (ANCS). For many years ANCS have been used and have been shown to improve fetal lung maturation, to decrease neonatal mortality, to have a protective effect on the incidence of intra-ventricular haemorrhagae (IVH) and, perhaps, to reduce the occurrence of necrotising enterocolitis (NEC). Their effect in the presence of prolonged prematurity of membranes (PPRM) and in the intrauterine growth retarded (IUGR) fetus is open to discussion and meets with contradictory results. ANCS have been incriminated in an increased incidence of bronchopulmonary chronic

Table 1. Multiplicity related disorders

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<th>Increased materno-foetal-neonatal mortality and/or morbidity</th>
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<td>PIH/PET/HELLP</td>
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<td>Foetal demise</td>
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Table 2. Controversies

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<th>Antenatal corticosteroids (ANCS)</th>
<th>Mode of delivery</th>
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<td>Spontaneous versus “iatrogenic” induced</td>
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l lung disease (BPD/CLD), especially in the IUGR fetus and in situations of prenatal infection [1-5]. In addition, ANCS have also played a suspicious role in the long-term unfavourable somatic development, neurological and behavioural outcome of surviving preterms, especially those submitted to repeated courses of ANCS [6-10]. Generally, all these, both favourable and unwanted, effects, have been acknowledged for single pregnancies. But what is known about ANCS in multiple pregnancies? Perhaps not a great deal. For instance, do twins mature earlier than singletons and, if so, at what gestational age do they start to accelerate their maturation? Will (mono/di)zygosity matter in terms of intrauterine functional development? Will gender matter in this context and, what if they are of a different sex? Will they, in this case, require the same dose? But, what is the dose for twins – the same as for singletons? Or, should they mature earlier, will they need only half the dose? Or because they are two, perhaps double the dose? How will the dose be equally distributed between the individual fetus? And, in the case of triplets or more?

These are some of the many, open questions. From the available (scanty) data it would appear, for instance, that in triplets and quads ANCS would be associated with intrauterine contractions, cervical changes and preterm labour [11] whilst the recommended regimen for ANCS would not reduce the incidence of respiratory distress syndrome (RDS) in twins [12] with ethnicity playing a subsidiary role [13]. On this subject of reduced efficacy of ANCS in higher order pregnancies it has been postulated that the shorter half-life of betamethasone in twin pregnancies may be responsible for the sub-therapeutic levels required to enhance lung maturation [14]. However, the changes in fetal heart rate (FHR), in FHR variability, in fetal body and breathing movements in twins following betamethasone administration would provide evidence that therapeutic levels are being achieved in the compartment of either twin [15]. Further proof of the efficacy of ANCS in multiples would come from the fact that complete courses of ANCS are associated with reduced risk of severe IVH in both singleton and multiple preterm, very low birth weight (VLBW) infants [16] and the concerns that the added maternal plasma volume in multiple pregnancies could lessen the neonatal benefits of ANCS have not been substantiated.

And so the controversy carries on ...

The mode of delivery, caeserian section versus vaginal delivery is, yet again, another source of discussion and contention. In general, the first twin presentation will dictate the route of delivery, with breech being, usually, an indication for caesarean section, regardless of zygosity. In addition, monozygotic twins, whether mono or dichorionic, may also benefit from a caesarean section, with a lower incidence of hypoxic-ischemic encephalopathy (HIE) and anaemia. Whether the caesarean section should be elective, or only following a trial of labour or as an emergency, remains controversial although many would favour an elective procedure, especially for the (late) preterm monozygotic twins [17-20]. Nevertheless, all the disadvantages of a caesarean section for singletons likewise, will remain the same, from pulmonary adaptation syndromes to increased gastrointestinal infections, to “priming”, to reduced maternal bonding and so on. Furthermore, the mode of delivery will not play a significant role in either the short or long term outcome, for those delivered below 27 weeks gestation, and the absence of a lower segment might determine a transverse incision, jeopardising future pregnancies. Another question should also be addressed when discussing the mode of delivery and that is whether there is any benefit for the mother from a caesarean section. The answer is probably not, due to the increased risk of postpartum haemorrhage, fever and hysterectomy, scar infection, thromboemboli (including the rare but severe amniotic fluid emboli), phlebitis, etc.

**Spontaneous versus “iatrogenic” induced (ART) multiples.**
The advent of ART, especially uncontrolled, has been responsible for the increasing number of higher order pregnancies and, consequently, for the increasing birth of preterm, VLBW infants and, not surprisingly, for major neurosensory handicaps, psychomotor delay, intellectual impairment and behavioural sequelae in survivors.

However, ART-induced versus spontaneous occurring multiples of similar gestational age and birth weight (except for the higher rate of caesarean sections) appear to be performing better, perhaps due to placentation and dichorionicity over monochorionicity playing a safeguard against bi-directional shunts, thromboemboli and thromboplastin transfer [21-27]. Reassuring as this might be, ART should not be an encouragement to bad medical practices of totally uncontrolled, indiscriminate, thoughtless technologies at the hands of uncritical and reckless practitioners.

**The offspring outcome**

Dealing with the offspring of multiple pregnancies – without going into the enormous financial resources involved, and they are not negligible – requires attention to many different aspects, some in the immediate neonatal period, others for life (Table 3).
All the problems affecting preterm multiples are similar to those of preterm singletons but to a greater extent, from increased intrauterine asphyxia to five-fold fetal death rates and seven-fold neonatal deaths. Prematurity is five times greater, with 53% for twins and 97% for triplets low birth weight (LBW), light for gestational age (LGA), intrauterine growth restriction (IUGR) becomes quite evident from 29 weeks gestation for triplets and from 32 weeks for twins [28]; for twins although 75% are concordant for BW (< 15% difference in BW), some 20% are mildly discordant (15-25%) and 5% severely discordant (> 25%) [29].

For survivors, neurological morbidity in preterm MC twins is seven times greater than DZ, probably due to FFTS, discordant BW and co-twin intrauterine death [30]. Cerebral palsy (CP) in MC is 20% vs 3.7% in DC; RR of CP/neurological sequelae is twenty-fold for the surviving co-twin [31]. In general, CP is four times those of singletons of similar gestational age and birth weight: RR factors for discordant BW, second twin and surviving co-twin of a still-birth, death after birth or with CP is 4.7%, 6.3% and 11.8% respectively [32].

These are the facts. But why do they occur? Due to placentation and chorionicity with the consequent sharing of bi-directional shunts, thromboemboli and thromboplastin transfer? Or could it just be due to pre-term single of a stillbirth, death after birth or with CP is 4.7%, 62% and 111.8% respectively [32].

Over the years there has been concerned about the physical, neurosensory and intellectual sequela, the behavioural problems and learning difficulties of survivors. How many of them, similar to singletons, after the delayed weight catch-up [33-36], will be at risk for the developing of the late metabolic syndrome of obesity, insulin resistance, high blood pressure and cardiovascular disorders [37, 38], is another reason for the continuous monitoring and follow-up of this population.

References


