OBSTETRICS

Discordant twins: diagnosis, evaluation and management

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Approximately 16% of twin gestations have discordance of at least 20%. We identified 14 risk factors for divergent growth that can be categorized as maternal, fetal, or placental. Determination of chorionicity and serial ultrasound evaluation with a high index of suspicion for divergent growth is required for the diagnosis and stratification of risk. The highest reported likelihood ratio for detection of discordance was 5.9 during the first trimester examination and 6.0 for the second trimester. Although our ability to identify discordant twins is limited, once suspected and at viable gestational age, these pregnancies should have antepartum testing. Discordant growth alone is not an indication for preterm birth. Although there are multiple publications on the increased morbidity and mortality rates with discordant growth, there is a paucity of reports on how to manage them optimally and deliver them in a timely manner.

Key words: chorionicity, discordance, discordant twins

Unique to multiple gestations, discordance is the difference in the weights of the fetuses. According to the American College of Obstetricians and Gynecologists (ACOG) practice bulletin on multiple gestation, discordant growth is associated with increased likelihood of anomalies, intrauterine growth restriction (IUGR), preterm birth, infection of 1 fetus, stillbirth, umbilical arterial pH <7.10, admission to neonatal intensive care unit, respiratory distress, and death within 1 week of birth.[1] Despite the known association with a multitude of adverse outcomes, what is debated about discordant twins are the following factors that decrease or predispose to discordant growth: the ability to identify abnormal growth, the threshold of discordance that significantly increases the perinatal complication rate, the comorbidities that alter the likelihood of poor outcome, and how to manage divergent growth.

The purpose of this review article was to summarize the literature on discordant growth among nonanomalous twins. We will discuss the various definitions, risk factors, and evaluation and management strategies. Because of the breadth of the subject matter, we will not focus on monoamniotic twins, twin-twin transfusion syndrome, anomalous fetuses, death of a twin, or suboptimal growth among twins.

Definition

Discordance is defined with the larger twin as the standard of growth and is calculated by the following equation: (larger estimated or actual weight – smaller estimated or actual weight)/larger estimate or actual weight). While acknowledging the lack of consensus on the precise threshold of discordance that is linked with complications, ACOG considers a 15-25% difference in actual weight among twins to be discordant.[1] The consensus statement by the Society of Obstetricians Gynecologists of Canada specifies that discordance is a difference of abdominal circumference (AC) of 20 mm or estimated fetal weight (EFW) difference of 20%. the Society of Obstetricians Gynecologists of Canada recommends that the EFW be derived from biparietal diameter with AC or a combination of AC and femur length.[2]

Prevalence and detection of discordant growth

A summary of 31 publications with >1.1 million twins indicates that the likelihood of discordance of ≥20% is 16% (180,302/1,130,505 twin pregnancies; range, 14–41%; Table 1).[3-33] Eight publications provided evidence of discordance of at least 30%; discordance has occurred in 5% of twins (42,373/854,331 twin pregnancies; range, 3–10%.[9,11,12,15,21,22,34,35] The rate of discordance, however, varied among publications with <1000 vs 1000-9999 vs ≥10,000 cohorts (Figure 1; $P < .0001$ for both comparisons). Discordance of at least 20% was significantly higher in 15 publications from foreign countries (17%; 11,369/65,997 twin pregnancies[5-7,16,19, 22-26, 29-31,33,35]) than in 16 reports from the United Sates (16%; 168,933/1,064,790 twin pregnancies; odds ratio [OR], 1.10; 95% confidence interval [CI], 1.08–1.12[3,4,9-15,17,18,20,21,27,28,32]). Even among publications with <1000 cohorts, discordance of >20% occurred significantly more commonly in other countries (19%; 520/2,712 twin pregnancies[5,7,16,19,25,26,29,31,33,35]) than in the United States (16%; 225/1,445 twin pregnancies; OR, 1.28; 95% CI, 1.08–1.52[3,4,10,11,18,27,28]). In 2006, there were 137,085 twin pairs born in the United States; if 16% were discordant, we estimate that there are approximately 22,000 discordant twin pairs born per year.

Table 2 shows predictive accuracies of 8 publications that gauged the reliability of the detection of ≥20% discordance[7,13,18,27,31,36-38] and 6 reports about the identification of discordance of at least 25%.[7,24,39-42] The sensitivity of the detection of difference in weights of ≥20% ranged from 31–93%; for ≥25% difference, the range was 23-61%. More

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TABLE 1
Likelihood of twin discordant growth

Study	Year	Country	Study period	Twins, n	Discordance ≥20%, n	Discordance ≥20%, %
Watson et al[3]	1991	USA	No mention	94	21	22
Eberle et al[4]	1993	USA	1986-1992	147	36	24
Jensen and Jenssen[5]	1995	Norway	1990-1993	73	14	19
Cheung et al[6]	1995	Canada	1989-1992	122	28	23
Blickstein et al[7]	1996	Israel	No mention	90	20	22
Yalçin et al[8]	1998	Turkey	1994-1995	357	115	32
Hollier et al[9]	1999	USA	1988-1996	1370	194	14
Grobman and Parilla[10]	1999	USA	1992-1988	44	18	41
Foley et al[11]	2000	USA	No mention	500	62	12
Demissie et al[12]	2002	USA	1995-1997	148,577	24,190	16
Kalish et al[13]	2003	USA	2000-2002	130	16	12
Branum and Schoendorf[14]	2003	USA	1995-1997	128,163	19,253	15
Sannoh et al[15]	2003	USA	1995-1997	294,568	47,796	16
Smiljan Severinski et al[16]	2004	Croatia	1993-2001	351	53	15
Amaru et al[17]	2004	USA	1992-2001	1318	208	16
Chauhan et al[18]	2004	USA	No mention	126	24	19
Usta et al[19]	2005	Lebanon	1984-2000	679	81	12
Tan et al[20]	2005	USA	1995-1997	147,262	23,071	16
Kontopoulos et al[21]	2005	USA	1995-1998	340,446	53,584	16
Wen et al[22]	2005	Canada	1986-1997	59,034	10,092	17
Armson et al[23]	2006	Canada	1988-2002	1542	211	14
Chang et al[24]	2006	Taiwan	1991-2002	1257	195	16
Canpolat et al[25]	2006	Turkey	2000-2004	266	54	20
Pongpanich and Borriboonhirunsarn[26]	2006	Thailand	2003-2004	150	35	23
Tai and Grobman [27]	2007	USA	2000-2006	169	24	14
Belogolovkin et al[28]	2007	USA	2000-2005	279	42	15
Appleton et al[29]	2007	Portugal	1989-2002	230	54	23
Hack et al[30]	2008	Netherlands	1995-2004	1305	351	27
Banks et al[31]	2008	United Kingdom	2002-2004	108	26	24
Nawab et al[32]	2008	USA	2001-2004	1597	394	25
Alam Machado Rde et al[33]	2009	Brazil	1998-2004	151	40	26
Total				1,130,505	180,302	16

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importantly, only 36% of these reports (5/14) provided likelihood ratios, which ranged from 1.3–6.0. It should be noted that according to the Society of Obstetricians Gynecologists of Canada,[2] the sensitivity of the detection of discordant growth with AC alone is 80% and with EFW is 25-55%.

We should not assume that it is feasible to identify the divergent growth. The reasons for our inabilities to identify discordant growth are the potential for publication bias, most reports are from tertiary centers and not community hospitals, the vagaries of sonographic EFW,[43] the known inabilities to identify abnormal fetal growth with singleton fetuses,[44] and most reports do not provide the likeli-