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Complication rates after chorionic villus sampling and midtrimester amniocentesis

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Objective

To assess the complication rates following chorionic villus sampling (CVS) and midtrimester amniocentesis in Taiwan.

Methods

This is a national registry-based cohort study from Taiwan. We included all singleton pregnant women who underwent CVS (n=1, 438) or amniocentesis (n=255, 727) during the years 2006-2012. We assessed preterm premature rupture of membranes (PPROM), intrauterine fetal demise (IUFD), infection and spontaneous abortion (SA) that occurred within 14 days after the procedures. We also assessed the risk of miscarriage before 24 gestational weeks and preterm delivery after amniocentesis. These complications were collected from the Genetic Disease Database (GDD) of the Ministry of Health and Welfare, Taiwan National Birth Certificate Registry, and the Taiwan National Health Insurance Database (NHID). Pearson χ2 tests were used to compare distributions between groups.

Results

For patients who underwent midtrimester amniocentesis, the rates of PPROM, IUFD, infection and SA within 14 days were 0. 24%, 0. 11%, 0. 05%, and 0. 05%, respectively. Women with a normal fetal karyotype had a preterm birth rate of 9. 38%. The miscarriage rate was 0. 68%, which was 0. 22% higher than those who did not receive invasive procedures (p<0. 0001). After CVS, the IUFD rate was 1. 68%, and the SA rate within 14 days was 0. 77%.

Conclusion

A review of recent studies and the use of our large cohort demonstrated that the procedure-related complication rates might not be as high as previously recognized. The low complication rates in our cohort might facilitate counselling in women who consider invasive genetic diagnostic procedures.

Table 1. Complication rates after invasive procedures.

Complications	**Amniocentesis**		**CVS**	
	N	**%**	**N**	**%**
Total number	250566	100.0	1409	100.0
PPROM		**0.25**		
0-7 days	446	0.18	<2	<0.1%
8-14 days	186	0.07	<2	<0.1%
IUFD		**0.11**		**1.70**
0-7 days	125	0.05	11	0.78
8-14 days	141	0.06	13	0.92
Infection		**0.05**		
0-7 days	105	0.04	<2	<0.1%
8-14 days	27	0.01	<2	<0.1%
Spontaneous abortion		**0.05**		**0.78**
0-7 days	82	0.03	7	0.50
8-14 days	48	0.02	4	0.28

CVS = chorionic villus sampling, PPROM = preterm premature rupture of membranes, IUFD = intrauterine fetal demise

Table 2. Pregnancy outcomes of subjects with and without invasive procedures.

Birth Outcome	No invasive procedures		Amniocentesis (≥15 weeks)					
	Total	%	Total	%	P value	Normal karyotype	%	P value
Number	1134403		231564			220399		
Gestational age (weeks)					<0.0001			<0.0001
<24 **(miscarriage)**	5205	0.46	3449	1.49	<0.0001	1493	0.68	<0.0001
24-33	14918	1.32	4982	2.15		4586	2.08	
34-36	64886	5.72	15233	6.58		14591	6.62	
≥37	1049382	92.51	207899	89.78		199728	90.62	
Preterm	85009	7.50	23664	10.22	<0.0001	20670	9.38	<0.0001

Table 3. Review of studies on procedure-related fetal loss after amniocentesis.

Study (y)	Study interval	Study design	Amniocentesis	Definition of pregnancy loss	Spontaneous fetal loss rate	Control group	Procedure-related risk
Tabor et al	1982-1984	RCT	2302	24 weeks	1.26	0.17	1.09
CEMAT group (1998)	1994-1996	RCT	2162	20 weeks	0.78		
Borrell et al (1999)		RCT	358	In 14 days/ 20/28 weeks	0.8/0.6/0.3		
Seeds et al (2004)	1984-2002	Review	34144	28 weeks	1.4	1.08	0.32
Eddleman et al (2006)	1999-2002	Case-control	3096	24 weeks	1	0.94	0.06
Kong et al (2006)	1997-2004	Cohort	3468	Before birth	1.66	0.8	0.86
Mujezinovic et al (2007)	1995-2006	Review	49413	In 14 days/24 weeks	0.6/0.9		0.6
Odibo et al (2008)	1990-2006	Cohort	11746	24 weeks	0.97	0.84	0.13
Tabor et al (2009)	1996-2006	Cohort	32852	24 weeks	1.4		
Pitukkijronnakorn et al (2011)	1997-2006	Case-control	2990	24/28 weeks	0.37/1.37	0.2/0.87	0.17/0.5
Akolekar et al (2015)	2000-2014	Meta-analysis	42716	24 weeks	0.81	0.67	0.11
Hsu et al (our data)	2006-2012	Cohort	220399	24 weeks	0.68	0.46	0.22