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# TRENDS IN POSTPARTUM HAEMORRHAGE IN IRELAND: AN ELEVEN-YEAR POPULATION-BASED COHORT STUDY

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**Objective** To derive population-based incidence rates of postpartum haemorrhage (PPH) and to investigate trends associated with method of delivery and blood transfusion. Specific focus was given to PPH due to atonic uterus, the commonest type of PPH. Consideration was also given to morbidly adherent placenta, a rare but severe obstetric complication involving abnormally deep placental adherence to the uterine wall.

**Design** Retrospective cohort study

**Setting** Ireland

**Population** All childbirth hospitalisations, 1999 through 2009

**Methods** Diagnostic codes from hospital discharge records were used to identify cases of PPH due to third stage haemorrhage, uterine atony, postpartum coagulation defects, or delayed and secondary PPH. Receipt of a blood transfusion was used as a proxy to indicate the severity of haemorrhage. Significant temporal trends in PPH incidence were determined using a Cochrane-Armitage test for trend. Multivariate logistic regression was conducted to measure the odds of PPH diagnosis by year of delivery while adjusting for potentially confounding covariates.

**Main outcome measures** PPH due to uterine atony; blood transfusion; morbidly adherent placenta.

**Results** Over the study period, there were 649 019 childbirth hospitalisations, of which 2.6% (n=16 909) included a diagnosis of PPH. The overall PPH rate among hospital-based deliveries increased from 1.5% in 1999 to 4.1% in 2009. The increase in the overall PPH rate was driven by a parallel increase in atonic PPH, which rose from 1.0% in 1999 to 3.4% in 2009. Irrespective of induction status, significant increasing trends in atonic PPH rates were observed across vaginal, instrumental and caesarean deliveries (p<0.001). Relative to 1999, the unadjusted odds of atonic PPH in 2009 was 3.4 (95% CI 3.1 to 3.7); adjustment for relevant risk factors did not attenuate observed period changes. Between 1999 and 2009, the rate of co-diagnosis of atonic PPH and blood transfusion increased from 1.8 to 5.5 cases per 1000 deliveries (p<0.001). Due to changes in diagnostic coding, data on morbidly adherent placenta were only available between 2005 and 2009; however, over this interval, the rate of co-diagnosis of morbidly adherent placenta and PPH increased from 2.8 to 4.7 cases per 10 000 deliveries.

**Conclusions** Analysis of hospital discharge data indicate changing trends in the incidence and severity of PPH due to uterine atony and morbidly adherent placenta. There is a pressing need for case-control studies and detailed clinical audit to identify clinical and patient-related factors associated with these conditions.