

Factors Influencing Instrumental Birth Rates: An Evidence-Based Project

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Background

- 5% to 20% of all births are instrumentally assisted, posing risks to the parturient woman and neonate.
- Women in labor may experience increased vaginal and perineal tearing and damage, anal sphincter injury, hematomas, or long-term damage to the pelvic muscles.
- The neonate may suffer fractures and damage to the skull, facial nerve damage, or death.
- Factors known to increase the risk for this procedure include pre-birth use of analgesics and prolonged active labor.
- It is important to quantify the rate of instrumental births and associated factors in hospital facilities to provide the best care for patients.

Purpose

- The purpose of this project was to determine the rate of instrumental assisted births and differences in factors among cases with and without this procedure for parturient women presenting for a live, vaginal birth at one of two Providence hospitals in Eastern Washington.

Methods

- This project utilized data retrospectively extracted from the electronic medical records of hospital accounts from two community-based hospitals in Eastern Washington.
- Data were included from hospital encounters of parturient women presenting for live, vaginal birth between October 2017 – October 2022 who were at least 18 years of age at the time of admission with a gestational age between 35.0 weeks and 42.0 weeks. The outcome variable was whether the neonate received an instrument-assisted birth with either forceps or a vacuum.

Results

- A total of 16,612 encounters met the criteria for analysis; of these, n=823 (5%) had documentation of an instrument-assisted birth.
- Cases receiving instrument-assisted births had significantly longer times from admission to birth (17.8h versus 14.1h).
- Additionally, proportionally more women with instrument-assisted births were parity less than one (64.1% versus 32.8%) and were administered a pre-birth analgesic as follows: CLE (92.1% versus 80.6%), opioid (12.6% versus 5.9%), and acetaminophen (20.3% versus 11.1%).
- Other factors measured in the table below were not statistically significant with this model.

Discussion

- Rates of instrument-assisted birth were low in the two hospitals.
- As anticipated, an increased proportion of parturient women experienced an instrument-assisted birth when administered a pre-birth analgesic.
- Time from admission to birth was significantly higher while parity was lower among women with the outcome.
- Increased admission to birth times increases the likelihood of receiving an instrumental assisted birth.

Implications for Practice

- Instrument-assisted birth is utilized by providers to ease the neonate's passage through the birth canal.
- Prolonged labor with higher pain may relate to difficulty passing the neonate through the canal, especially as a first-time parturient. Sharing this information may help reduce the incidence of this outcome in the two hospitals.

Acknowledgments

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	All Births N = 16,612	Non-Instrument Assisted N = 15,789 (95.0%)	Instrument Assisted N = 823 (5.0%)	P-Value*
Gestational Age (Weeks)	38.8 (1.2)	38.8 (1.2)	38.9 (1.2)	0.005
Neonate Birth Weight (Ounces)	118.4 (16.5)	118.4 (16.5)	117.6 (16.4)	0.14
Admission to Birth (Hours)	14.3 (14.4)	14.1 (14.5)	17.8 (11.0)	<0.001
Maternal BMI	31.8 (6.1)	31.8 (6.1)	31.8 (6.0)	0.914
Maternal Age (Years)	28.6 (5.2)	28.6 (5.2)	28.5 (5.2)	0.548
Multiparous	10,383 (62.5)	10,113 (64.1)	270 (32.8)	<0.001
Continuous Labor Epidural	13,482 (81.2)	12,724 (80.6)	758 (92.1)	<0.001
Acetaminophen Usage	1,917 (11.5)	1,750 (11.1)	167 (20.3)	<.001
Opioid Usage	1,043 (6.3)	939 (5.9)	104 (12.6)	<0.001

For references, please press the following hyperlink: [References](#)