Factors Associated With Timely Completion Of Newborn Hearing Screening 2007-2012

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Background/Objectives

- The Joint Commission on Infant Hearing recommends completion of newborn hearing screening (NHS) by 1 month of age
- Demographic factors associated with loss to follow-up an delayed diagnosis and intervention have been identified in previous studies
- Objective: To identify hospital practices that may improve timely completion of newborn hearing screening

Methods

Study Design
- Retrospective cohort study of infants born in Colorado hospitals (2007-2012) who did not pass the inpatient Newborn Hearing Screen (N=15,366)
- Cross-sectional study of NHS Hospital Coordinators (N=53)

Data Sources
- Electronic Birth Registry
- Infant Hearing Integrated Data System
- Survey of Newborn Hearing Screening Hospital Coordinators

Exclusion Criteria
- Home Birth (N=103)
- Birth at a hospital / birthing center that does not have a Newborn Hearing Screening program (N=29)

Outcomes
- Completion of Follow-up Newborn Hearing Screen (Table 1; Fig 1a,1b)
- Completion of Follow-up Newborn Hearing Screen by 1 month (Tables 2,3; Fig 2, 3)

Analysis
- Multi-level Logistic Regression controlling for all covariates significant at p<0.25 in bivariate analyses
- Stratified by NICU admission

Results

Model 1: Factors Associated With Completion Of Follow-up Hearing Screening Among Well Newborns (N=13,904)*

Figure 1a

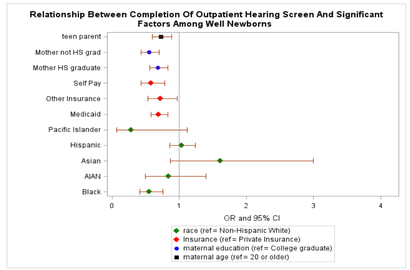
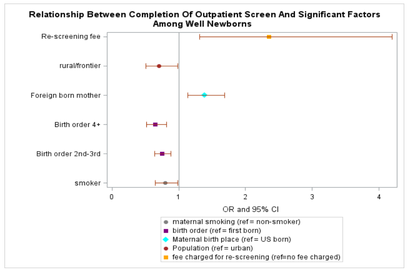


Figure 1b



*Controlling for birthing facility, maternal age, race, maternal education, payer, maternal smoking, drinking, birth order, herpes, maternal birthplace, length of time in US, population, hyperbilirubinemia

Table 1

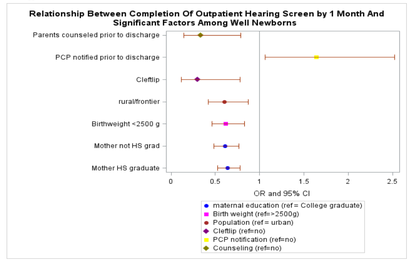
Factor	Reference	OR Estimate	95% CI	P value
Maternal Age	20 years or older	0.728	0.600,0.885	0.0014
Race	White, Non-Hispanic			0.0005
Hispanic		1.035	0.862,1.243	
Black		0.555	0.409,0.743	
Pacific Islander		0.283	0.072,1.114	
American Indian / Alaskan Native		0.836	0.499,1.398	
Asian		1.610	0.866,2.992	
Maternal Education	College Graduate			<0.0001
HS Graduate		0.682	0.558,0.834	
Did not complete HS		0.551	0.431,0.704	
Payer	Private Insurance			0.0002
Medicaid		0.690	0.576,0.827	
No Insurance / Self Pay		0.581	0.429,0.788	
Other		0.719	0.534,0.967	
Maternal Smoking	Non-smoker	0.796	0.646,0.982	0.0334
Birth Order	First Born			0.0002
2nd/3rd born		0.750	0.639,0.880	
4th or higher		0.650	0.520,0.812	
Mother's Birth Country	United States	1.385	1.136,1.689	0.0013
Population	Urban	0.708	0.508,0.986	0.0411
Rescreening Fee	No	2.350	1.316,4.195	0.0039

Model 2: Factors Associated With Completion Of Hearing Screening By 1 Month Among Well Newborns (N=11,422)*

Table 2

Factor	Reference	OR Estimate	95% CI	P value
Maternal Education	College Graduate			<0.0001
HS Graduate		0.682	0.558,0.834	
Did not complete HS		0.551	0.431,0.704	
Birthweight	<2500 grams	0.616	0.459,0.826	0.0012
Cleft Lip	No	0.603	0.418,0.868	0.0130
Population	Urban	0.708	0.508,0.986	0.0066
PCP notified prior to discharge	No	1.639	1.065,2.523	0.0248
Parents counseled prior to discharge	No	0.337	0.144,0.788	0.0121

Figure 2



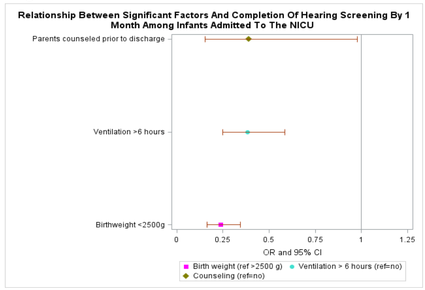
*Controlling for birthing facility, maternal age, maternal education, payer, gestational age, birth weight, population, downs syndrome, cleft lip

Model 3: Factors Associated With Completion Of Hearing Screening By 1 Month Among NICU Infants (N=844)*

Table 3

Factor	Reference	OR Estimate	95% CI	P value
Birthweight	>2500 grams	0.237	0.163,0.344	<0.0001
Ventilation >6 hours	No	0.383	0.250,0.586	<0.0001
Parents counseled prior to discharge	No	0.390	0.155,0.978	0.0448

Figure 3



* Controlling for birthing facility, payer, rubella, gestational age, birth weight, antibiotics, ventilation > 6 hours, cleft lip

Conclusions & Limitations

- Unlike previous studies, Hispanic ethnicity was not a risk factor for Loss to Follow-up / Loss to Documentation in our population
- Mothers born outside of the U.S. had increased odds of completing hearing screening suggesting language other than English was not a barrier to completion of NHS
- To the best of our knowledge, this is the first study that suggests providing separate notification to primary care providers (PCPs) when infants do not pass the inpatient NHS may increase the odds of follow-up within 1 month
- Counseling families prior to discharge significantly decreased the odds of completion of NHS by 1 month suggesting that information provided during counseling may diminish the importance of timely follow-up
- Limitations
  - A cross-sectional survey was distributed to NHS coordinators at Colorado hospitals, it is possible that some practices identified in the survey may have changed over the course of the study period

Implications

- Programs seeking to improve timely follow-up should consider implementing a protocol to improve communication with the medical home ensuring that PCPs are aware when their patients do not pass the inpatient NHS
- Programs seeking to improve timely follow-up may consider implementing counseling protocols for staff and volunteers

Disclosures/Contact

- Authors have no relevant disclosures
- Dr. Cunningham was supported by HRSA grant T32HP10006
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