Irish Medical Journal
Established 1867

Issue: Ir Med J; January 2022; Vol 115; No. 1; P530

Impact of Gestational Age on Sweat Testing

A. Gallagher[1], K. Hooley[2], S. Costello[2], S. Felsenstein[1], D. Mullane[1], E. Dempsey[3], M. Ní Chróinín[1]

1. *Paediatrics Department, Cork University Hospital, Wilton, Cork, Ireland.*
2. *Department of Clinical Biochemistry, Cork University Hospital, Wilton, Cork.*
3. *Neonatology Department, Corm University Maternity Department, Wilton, Cork.*

Dear Editor,

Cystic Fibrosis (CF) is a common autosomal recessive life-limiting multisystem disease. Ireland has previously reported the highest incidence and carrier rates in the world, at one in 1,350 and one in 19 respectively[1]. Benefits of early diagnosis of cystic fibrosis are well documented in the literature[2]. Sweat testing remains the diagnostic gold standard for CF. Cystic fibrosis was added to the Newborn Screening Programme in Ireland in 2011. Since then, infants with high immunoreactive trypsinogen (IRT) detected on Newborn Screening undergo subsequent genetic testing with the CFTR mutation panel. If one or two CFTR variants are detected a sweat test is then carried out.

Despite overall failure rates for sweat testing for all age groups including adults and older children being low (internationally acceptable rate <5%), there is huge variability and much higher failure rates (0-50%) for sweat testing in newborn screening programmes worldwide[3], a more difficult cohort to successfully sweat test. An initial quantity not sufficient (QNS) result can be stressful for both parents and clinicians.

An audit performed in Cork University Hospital in 2019 looked at sweat testing carried out as part of newborn screening from 2011-2018 and assessed the number of patients with positive (>60mmol/l), negative (<30mmol/l), equivocal (30-60mmol/l) and QNS results. Ethical approval was obtained from Clinical Research Ethics Committee of the Cork Teaching Hospitals. The gestational age at birth and at time of testing and birth weight were examined as potential variables. Sweat testing data was obtained from laboratory records. Analysis was performed using Stata.

Infants with initial QNS result were compared to those with successful testing. Infants were divided into groups based on gestation, less than and above 39 weeks, and birth weight, greater than or less than 2.5kg. Results were dichotomised into sufficient and insufficient (QNS) results.

The Chi square test indicated that there is a statistically significant association between gestational age and sufficient or insufficient result. (p=0.004). A probit regression and estimated marginal effects, illustrated that infants with gestation less than 39 weeks were 26.9 percentage points more likely to get an insufficient result. Birth weight was not found to be statistically significant.

Consideration could therefore be given to delay offering sweat testing by one to two weeks to those born at 37 and 38 weeks gestation in infants who only have one mutation. We would recommend sweat testing should be performed at a gestational age of 43 weeks rather than 3 weeks of life. This may reduce need for time consuming and stressful repeat testing.

Corresponding Author:
Dr Aoife Gallagher,
Paediatrics Department,
Cork University Hospital,
Wilton,
Cork,
Ireland.
E-Mail: aoifemariegallagher1@gmail.com

References:

1. Farrell P, Joffe S, Foley L, Canny GJ, Mayne P, Rosenberg M. Diagnosis of cystic fibrosis in the Republic of Ireland: epidemiology and costs.
2. Dankert-Roelse JE, Vernooij-van Langen A. Newborn screening for cystic fibrosis: pros and cons. Breathe. 2011 Sep 1;8(1):24-30.
3. Shenoy A, Spyropoulos D, Peeke K, Smith D, Cellucci M, Chidekel A. Newborn Screening for Cystic Fibrosis: Infant and Laboratory Factors Affecting Successful Sweat Test Completion. International journal of neonatal screening. 2021 Mar;7(1):1.