

# Hubungan antara Refluks Gastroesofagus dengan Kejadian Apnea, Desaturasi, dan Bradikardi pada Bayi Prematur = The Association between Gastroesophageal Reflux with Apnea, Desaturation, and Bradycardia in Preterm Baby

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## Abstrak

Latar belakang: Refluks gastroesofagus merupakan hal yang normal pada bayi prematur karena fungsi sfingter esofagus bawah belum sempurna. Penegakkan diagnosis refluks seringkali didasarkan oleh gejala klinis berupa apnea, desaturasi, dan bradikardi. Gejala-gejala tersebut sering dijadikan dasar untuk pemberian terapi *proton pump inhibitor*. Kondisi *overdiagnosis* dan *overtreatment* ini bukan hanya terjadi di Indonesia, tetapi secara

global.

**Tujuan:** Mengetahui frekuensi kejadian refluks, apnea, desaturasi, dan bradikardi pada bayi prematur. Mengetahui faktor risiko refluks pada bayi prematur terkait dengan modalitas suplementasi oksigen dan strategi pemberian susu. Mengetahui hubungan refluks dengan apnea, desaturasi, dan bradikardi.

**Metode:** Penelitian analitik observasional dengan desain potong lintang. Subjek adalah bayi prematur dengan *postmenstrual age* 32-36 minggu yang memiliki riwayat apnea, desaturasi, atau bradikardi dicurigai akibat refluks. Subjek sudah mendapat susu minimal 60 mL/kg/hari. Subjek dieksklusi jika sudah mendapat obat prokinetik, penekan asam lambung, menggunakan alat bantu pernapasan yang lanjut (terintubasi, *noninvasive positive pressure ventilation*, atau *continuous positive airway pressure* dengan *positive and expiratory pressure* >7 cmH<sub>2</sub>O), terdapat kelainan intrakranial, kongenital mayor, atau dalam kondisi sepsis. Posisi semua bayi adalah terlentang dengan kepala lebih tinggi 45°. Diagnosis refluks ditegakkan dengan menggunakan pemeriksaan baku emas, yaitu *multipel intraluminal impedance* – pHmetri, yang merekam kejadian refluks selama 24 jam. Diagnosis apnea, desaturasi, dan bradikardi ditegakkan dengan perekaman monitor hemodinamik dan pencatatan oleh perawat selama 24 jam.

**Hasil:** Dari total 20 subjek, terdapat 3882 refluks selama 24 jam. Dari refluks tersebut, sebanyak 331 refluks (8,5%) mencapai batas sfingter esofagus atas. Sebanyak 17 subjek (85%) mempunyai nilai indeks refluks normal (<5). Dari 2 subjek yang mempunyai indeks refluks 10, tidak ada gejala klinis esofagitis refluks yang khas. Karakteristik refluks sebagian besar merupakan jenis refluks cair (79,9%) yang bersifat asam lemah (84,6%). Tidak ada hubungan yang signifikan antara refluks dengan jenis suplementasi oksigen, jenis susu, frekuensi pemberian susu, durasi pemberian susu, ataupun volume pemberian susu. Proporsi refluks tinggi yang disertai dengan apnea dan bradikardi sangat kecil (0,3%). Secara statistik, refluks tinggi tidak berhubungan dengan kejadian desaturasi. Namun, terdapat 2 subjek (10%) yang mempunyai refluks tinggi disertai dengan desaturasi. Pada kedua subjek tersebut, tidak ada *alarm symptoms* yang khas.

**Kesimpulan:** Semua bayi prematur mengalami refluks, tetapi hanya 15% yang mengalami refluks patologis. Refluks pada bayi prematur tidak dipengaruhi oleh modalitas suplementasi oksigen ataupun strategi pemberian susu. Tidak ada hubungan antara refluks dengan kejadian apnea, desaturasi, dan bradikardi.

.....Background: Gastroesophageal reflux is common in premature baby due to immature lower esophageal

sphincter function. The diagnosis of reflux is often based on clinical symptoms such as apnea, desaturation, and bradycardia. Furthermore, these symptoms are often used as the basis by clinicians to provide proton pump inhibitor therapy. This condition of overdiagnosis and overtreatment does not only occur in Indonesia but globally.

**Objective:** To determine the frequency of reflux, apnea, desaturation, and bradycardia in preterm infants. To determine the risk of reflux in preterm infants related to oxygen supplementation and milk feeding strategy. To determine the significance of the association between reflux with apnea, desaturation, and bradycardia.

**Method:** Observational analytic study with a cross-sectional design. Subjects were preterm infants with postmenstrual age of 32-36 weeks who have a history of apnea, desaturation, or bradycardia suspected of reflux and have received milk at least 60 mL/kg/day. Subjects were excluded if they have received prokinetic drugs, gastric acid suppressants, are still using advanced respiratory support (intubated, non-invasive positive pressure ventilation, or continuous positive airway pressure with positive and expiratory pressure >7 cmH<sub>2</sub>O), having intracranial abnormalities, major congenital abnormalities, or sepsis condition. The position of all subjects is lying with head elevated 45°. Diagnosis of reflux was done using the gold standard examination, namely multiple intraluminal impedance – pHmetry, which records for 24 hours. Diagnoses of apnea, desaturation, and bradycardia were made with 24-hour hemodynamic monitor recording and was recorded by the attending nurse.

**Results:** From a total of 20 subjects, there were 3,882 refluxes over 24 hours. Of these refluxes, 331 refluxes (8.5%) reached the upper esophageal sphincter. A total of 17 subjects (85%) had normal reflux index values (<5). Of the 2 subjects who had a reflux index 10, there were no typical clinical symptoms of reflux esophagitis. Reflux characteristics were mostly liquid reflux (79.9%) and weak acid reflux (84.6%). There is no significant relationship between reflux with modes of oxygen supplementation, types of milk, frequency of feeding, duration of feeding, and milk volume. The proportion of high reflux accompanied by apnea and bradycardia was very small (0.3%). Statistically, high reflux was not associated with the incidence of desaturation. However, there was two subjects (10%) with refluxes accompanied by desaturation. There was no specific alarm symptoms in both subjects.

**Conclusion:** Reflux occurs in all preterm infants, but only 15% of them have pathological reflux. Reflux in preterm infants is not affected by oxygen supplementation modes or milk feeding strategy. There is no association between reflux and the incidence of apnea, desaturation, and bradycardia.