Perbandingan High-Flow Nasal Cannula (Hfnc) dan Terapi Oksigen Konvensional (Tok) terhadap fungsi diafragma pada Pasien Pasca Pembedahan Abdomen Atas = Comparison of High-Flow Nasal Cannula (HFNC) and Conventional Oxygen Therapy (COT) in supporting diaphragm function following Upper Abdominal Surgery

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Abstrak

Pembedahan abdomen atas berkaitan disfungsi diafragma. Disfungsi diafragma merupakan penyebab PPC (postoperative pulmonary complication). Terapi oksigen konvensional (TOK) merupakan terapi standar pada pasien pasca pembedahan abdomen atas. Terapi HFNC (high-flow nasal cannula) memiliki berbagai mekanisme yang berbeda dengan TOK dan dipikirkan dapat membantu fungsi diafragma pascapembedahan abdomen atas. Studi ini bertujuan untuk membandingkan kemampuan HFNC terhadap TOK dalam mempertahankan fungsi diafragma pascapembedahan abdomen atas. Studi ini dilakukan di RSUPN Dr. Cipto Mangunkusumo dari November 2018 – September 2019. Tujuh puluh satu pasien dibagi secara acak menjadi dua kelompok: kelompok TOK dan HFNC. Enam puluh enam pasien mendapat intervensi setelah ekstubasi di ICU (intensive care unit). Seluruh subjek dilakukan pencatatan nilai DTF (diaphragm thickening fraction) menggunakan ultrasonografi, TIV (perubahan tidal impedance variance), EELI-G dan EELI-ROI (perubahan end expiratory lung impedance global dan region of interest) menggunakan EIT (electrical impedance tomography), PaO2 dan PaCO2 (tekanan parsial oksigen dan karbon dioksida arteri) secara berkala pada dua seri. Efek samping dan keluhan yang muncul dicatat dan ditatalaksana. Total 66 subjek disertakan dalam bivariat menggunakan t-test dan mann whitney, sedangkan analisis tren menggunakan general linear model atau generalized estimating equation. Durasi ventilasi mekanik di ICU, persentase prediksi mortalitas dan skor P-POSSUM antara kedua kelompok berbeda signifikan (p=0,003; 0,001; dan 0,019, secara berurutan). Tidak ada perbedaan tren yang ditemukan antarkelompok pada seri pertama parameter DTF, TIV, EELI-G, EELI-ROI dan PaCO2 (p=0,951; 0,100; 0,935; 0,446; dan 0,705, secara berurutan) maupun pada seri kedua (p=0,556; 0,091; 0,429; 0,423; dan 0,687, secara berurutan). Tren PaO2 pada seri pertama dan kedua berbeda sangat signifikan (p<0,001) karena protokol pengaturan fraksi oksigen yang lebih tinggi pada kelompok TOK. Penggunaan HFNC tidak lebih baik daripada TOK dalam membantu mempertahankan fungsi diafragma pascapembedahan abdomen atas.

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Upper abdominal surgery is related to diaphragmatic dysfunction. Diaphragmatic dysfunction is the main factors causing postoperative pulmonary complication (PPC). Conventional oxygen therapy (TOK) in the form of nasal cannula, is a standard therapy in post upper abdominal surgery patients. High-flow nasal cannula (HFNC) therapy has a variety of mechanisms that differ from TOK and is thought to be able to maintain diaphragm function in post upper abdominal surgery patients. This study aims to compare the ability of HFNC vs TOK in maintaining diaphragm function for post upper abdominal surgery patients. This study was conducted at RSUPN dr. Cipto Mangunkusumo from November 2018 - September 2019. Seventy-one patients were randomly divided into two groups: TOK and HFNC groups. Sixty-six patients received intervention after extubation in the intensive care unit (ICU). This given data were all collected

periodically in 2 series; diaphragm thickening fraction (DTF) values using ultrasonography, changes in tidal impedance variance (TIV), changes in global end expiratory lung impedance and region of interest (EELI-G and EELI-ROI) using electrical impedance tomography, arterial oxygen and carbon dioxide partial pressure (PaO2 and PaCO2). Side effects and complaints that arise were collected and managed. A total of 66 subjects were included in the bivariate using t-test and mann whitney test, while trends were analyzed by general linear models or generalized estimating equations. The baseline characteristics of mechanical ventilation duration in the ICU, the predicted mortality rate and P-POSSUM score between the two groups were significantly different ($p = 0.003$; 0.001; and 0.019, respectively). No trend differences were found between groups in the first series of DTF, TIV, EELI-G, EELI-ROI and PaCO2 parameters ($p = 0.951$; 0.100; 0.935; 0.446; and 0.705, respectively) and in the second series ($p = 0.556$, 0.091, 0.429, 0.423 and 0.687, respectively). The PaO2 trends in the first and second series differed very significantly ($p<0.001$) due to the higher oxygen fraction regulation protocol in the COT group. The use of HFNC is no better than COT in maintaining diaphragm function for post upper abdominal surgery patients.