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Toho Journal of Medicine Vol. 3 No. 1 掲載論文の紹介

Omega-3 polyunsaturated fatty acids and human health: Protective role in cardiovascular disease

Tatsuno I

Toho J Med 3 (1): 1 – 9, 2017

要約 :

The findings of an epidemiological study of Danish Greenland Inuit indicated that fish oil (omega-3 fatty acids) was important in preventing atherosclerotic disease. After that landmark research, large-scale epidemiological studies, clinical outcomes trials, and meta-analyses examined the health benefits of omega-3 fatty acids as part of a diet rich in fatty acids and found statistically significant relative reductions in cardiovascular risk among people consuming omega-3 fatty acids. This article reviews omega-3 studies during the last 50 years and identifies issues relevant to future studies of cardiovascular risk.

KEYWORDS: omega-3 polyunsaturated fatty acids, cardiovascular disease, hypertriglyceridemia, eicosapentaenoic acid, docosahexaenoic acid

Cryoprecipitate may reduce the need for blood products during congenital heart surgery

Katayama Y

Toho J Med 3 (1): 10 – 16, 2017

要約 :

Background: This study assessed the effectiveness of cryoprecipitate — a concentrated product containing coagulation factors from fresh frozen plasma — in managing dilutional coagulopathy during congenital heart surgery.

Methods: This prospective observational study included 10 consecutive patients with complex congenital heart disease, including tetralogy of Fallot, who underwent surgery involving cardiopulmonary bypass during the period from November 2014 to April 2015. The 10 patients received cryoprecipitate and cryoprecipitate-removed plasma in addition to conventional transfusion. Their results were compared with those of 10 consecutive patients with complex congenital heart disease who had undergone heart surgery during the period from January 2014 to October 2014 and received conventional transfusion alone.

Results: Plasma fibrinogen concentration increased from 257 mg/dl to 892 mg/dl during the acquisition of cryoprecipitate from plasma. The average number of transfused units of fresh frozen plasma, including the cryoprecipitate source and amount of platelet concentrate transfused, were lower in patients receiving cryoprecipitate (4.5 ± 2.2 vs 6.3 ± 4.4 units, 56.3 ± 61.6 vs 135 ± 152 ml, respectively; $p < 0.05$).

Conclusions: Use of cryoprecipitate might reduce the amount of transfused blood products needed during complex congenital heart surgery under cardiopulmonary bypass.

KEYWORDS: congenital heart surgery, blood transfusion, cryoprecipitate

Clinical utility of prenatal head-to-abdominal circumference ratio for prediction of small-for-gestational-age birth: A retrospective study

Toyama T, Hine K, Maruyama K, Ishida Y, Hirota S, Yoda H

Toho J Med 3 (1): 17 – 25, 2017

要約 :

Background: Head-to-abdominal circumference (HC/AC) ratio on prenatal ultrasonography is useful for diagnosis of

intrauterine growth retardation. This study assessed the utility of an HC/AC ratio cut-off point for predicting small-for-gestational-age (SGA) birth.

Methods: We retrospectively studied perinatal data from 177 neonates: 36 were classified as being SGA with systemic disease, 23 as SGA without systemic disease, 78 as appropriate-for-gestational-age (AGA) with systemic disease, and 40 as normal.

Results: HC/AC ratio correlated with gestational age ($r = -0.322$, $p = 0.024$) in the normal group but not in the other groups (SGA with disease group, $r = -0.116$, $p = 0.316$; SGA without disease, $r = -0.350$, $p = 0.085$; AGA with disease, $r = -0.121$, $p = 0.123$). An HC/AC ratio cut-off value of 1.15 identified risk of SGA at birth (sensitivity, 70%; specificity, 65%; $p < 0.0001$). An HC/AC ratio greater than 1.15 on follow-up ultrasonography was associated with increased risk of SGA at birth (odds ratio, 8.727; 95% confidence interval, 2.987 – 25.498; $p < 0.001$).

Conclusions: Prenatal HC/AC ratio did not decrease in SGA neonates. HC/AC ratio predicted the incidence of SGA at birth, regardless of gestational age.

KEYWORDS: estimated fetal weight, intrauterine growth retardation, head-to-abdominal circumference ratio, small-for-gestational-age, ultrasonography

Use of urinary biomarkers for early diagnosis of acute kidney injury after descending thoracic aorta surgery
Kamada T, Ochiai R

Toho J Med 3 (1): 26 – 33, 2017

要約 :

Background: Acute kidney injury (AKI) is a common complication after cardiovascular surgery. The incidence of AKI after cardiovascular surgery is high, which worsens outcomes. We examined the incidence of AKI after aortic surgery without circulatory arrest and the effectiveness of AKI urinary biomarkers, including liver-type fatty acid-binding protein (L-FABP) and neutrophil gelatinase-associated lipocalin (NGAL).

Methods: The participants were 60 adults who underwent surgery for a descending thoracic aortic aneurysm with left heart bypass technique under general anesthesia. Urinary L-FABP and NGAL levels were measured immediately and 24 hours after surgery and compared between patients with and without AKI.

Results: Twenty-one patients (35%) developed AKI. Urinary L-FABP level significantly differed between the AKI group and non-AKI group at 24 hours after surgery. In contrast, urinary NGAL was not associated with AKI.

Conclusions: After replacement of the descending aorta, which can cause mild reperfusion injury, L-FABP was better than NGAL in predicting postoperative AKI.

KEYWORDS: aortic surgery, acute kidney injury (AKI), liver-type fatty acid-binding protein (L-FABP), neutrophil gelatinase-associated lipocalin (NGAL)

Countermeasures against methicillin-resistant *Staphylococcus aureus* transmission: Non-screening preemptive isolation and cohorting of patients with respiratory tract devices

(メチシリン耐性黄色ブドウ球菌交差感染対策としての呼吸器管理患者に対する非スクリーニングで予防的な個室管理および集団管理)

Kiribayashi T, Kusachi S, Watanabe M, Nishimuta H, Hagiwara O, Saida Y

Toho J Med 3 (1): 34 – 40, 2017

要約 :

目的 : 外科病棟における methicillin-resistant *Staphylococcus aureus* (MRSA) 対策のうえで気管内挿管および気管切開を行っている患者 (respiratory tract device : RT-D) を non-screening pre-emptive isolation and cohorting (NSPEIC) することの意義を検討した。

対象および方法：1987年9月～2014年5月までに東邦大学医療センター大橋病院病棟に入室したRT-D患者217例，および同時期に外科病棟に入院していた気管切開や気管内挿管を行っていない患者で呼吸器感染以外の材料からMRSAが分離された術後患者216例（non respiratory tract device：non-RT-D）を対象とした。I期では，薬剤感受性の一致，コアグラゼ型，エンテロトキシン型，toxic shock syndrome toxin 1（TSS-1）産性能，そしてファージ型の全てが一致した場合とした。II期以降はpulsed-field gel electrophoresis（PFGE）の型別で判定した。個室/集団管理（isolation and cohorting：IC）の適応は，I期（1987.9-1990.2）とIII期（1997.9-1999.2）では，RT-D患者をMRSA陽性が判明してからICを行い，II期（1990.3-1997.8）とIV期（1999.3-2014.5）では，RT-D患者は全てNSPEICを行った。

結果：I期では93.1%（27/29）がMRSAの型別が一致した。II期ではすべて一致しなかった。III期では85.7%（18/21），IV期では4.7%（2/43）でMRSAの型別が一致した。

結論：II期，IV期では，I期およびIII期に比較し有意に一致率が低く，MRSAの交差感染を予防する有効な対策であると考えた。

索引用語：メチシリン耐性黄色ブドウ球菌，個室管理，集団管理，定着，人工呼吸器関連性肺炎

Left ventricular diastolic dysfunction is an independent predictor of late recurrence after successful radiofrequency catheter ablation of persistent or paroxysmal atrial fibrillation

Koike H, Fujino T, Koike M, Shinohara M, Yuzawa H, Suzuki T, Fukunaga S, Kobayashi K, Ikeda T
Toho J Med 3 (1): 41 - 49, 2017

要約：

Background: Several echocardiographic parameters assessed before radiofrequency catheter ablation (RFCA) are associated with recurrence of atrial fibrillation (AF). However, data are limited on the associations of changes in these parameters and late recurrence (LR) of AF.

Methods: This study investigated data from 198 consecutive patients with AF (age 63.4 ± 10.5 years; paroxysmal AF 65.7%) who successfully underwent RFCA and maintained sinus rhythm for at least 1 year after RFCA. All patients underwent echocardiography at baseline and at 3 months and 1 year after RFCA. We analyzed associations of LR (any recurrence later than 1 year after RFCA) with changes in echocardiographic parameters, namely, left ventricular ejection fraction, left atrial diameter (LAD), and E/A and E/e' ratios.

Results: During a mean follow-up period of 29.7 ± 11.9 months, 17 patients (8.6%) developed LR. As compared with patients who maintained sinus rhythm, patients with LR had a significantly higher LAD at 1 year after RFCA (36.5 vs 39.2 mm, respectively; $p < 0.001$) and a significantly higher E/e' ratio (10.6 ± 4.1 vs 13.0 ± 3.7 , respectively; $p = 0.017$). Kaplan-Meier and multivariate Cox proportional hazards models revealed that an E/e' ratio >10 (hazard ratio, 4.44; 95% confidence interval, 1.269 - 15.53; $p = 0.020$) and use of antiarrhythmic drugs after RFCA (hazard ratio 2.81; 95% confidence interval, 1.079 - 7.299; $p = 0.034$) were significant predictors of and independently associated with LR, regardless of LAD.

Conclusion: LAD significantly improved in patients who maintained sinus rhythm after RFCA; however, improved LAD was not associated with decreased risk of LR. An E/e' ratio >10 at 1 year after RFCA was significantly associated with LR.

KEYWORDS: E/e' ratio, left atrial diameter, echocardiography, and pulmonary vein isolation