

Thu. Jul 7, 2016

第C会場

AHA-AEPC-JSPCCS-TSPC Joint Symposium

AHA-AEPC-JSPCCS-TSPC Joint Symposium  
( AJS)

Heart examination and sudden cardiac death

座長:

安河内 聡 (長野県立こども病院 循環器センター)

Jan Janousek (2nd Faculty of Medicine of the Charles  
University and University Hospital Motol Children's Heart  
Centre)

8:40 AM - 10:40 AM 第C会場 (オーロラ ウェスト)

[AJS-01] Screening Models from The Children's  
Hospital of Philadelphia for Conditions  
Associated with Sudden Cardiac Death  
○Victoria L. Vetter (Professor of Pediatrics The  
children's Hospital of Philadelphia Perelman School  
of Medicine at the University of Pennsylvania)  
8:40 AM - 10:40 AM

[AJS-02] Screening for sudden cardiac death in the  
young: Useful tool or wishful thinking  
○Jan Janousek (Children's Heart Center,  
University Hospital Motol Prague, Czech)  
8:40 AM - 10:40 AM

[AJS-03] Heart Examination and Sudden Cardiac Death  
○Mei-Hwan WU (Superintendent, National Taiwan  
University Children's Hospital Taipei, Taiwan)  
8:40 AM - 10:40 AM

[AJS-04] 学校心臓検診と突然死予防  
○太田 邦雄 (金沢大学医薬保健研究域 小児科)  
8:40 AM - 10:40 AM

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### Heart examination and sudden cardiac death

座長:

安河内 聡 (長野県立こども病院 循環器センター)

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Children's Heart Centre)

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AJS-01~AJS-04

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#### [AJS-01] Screening Models from The Children's Hospital of Philadelphia for Conditions Associated with Sudden Cardiac Death

○Victoria L. Vetter (Professor of Pediatrics The children's Hospital of Philadelphia  
Perelman School of Medicine at the University of Pennsylvania)

8:40 AM - 10:40 AM

#### [AJS-02] Screening for sudden cardiac death in the young: Useful tool or wishful thinking

○Jan Janousek (Children's Heart Center, University Hospital Motol Prague, Czech)

8:40 AM - 10:40 AM

#### [AJS-03] Heart Examination and Sudden Cardiac Death

○Mei-Hwan WU (Superintendent, National Taiwan University Children's Hospital Taipei,  
Taiwan)

8:40 AM - 10:40 AM

#### [AJS-04] 学校心臓検診と突然死予防

○太田 邦雄 (金沢大学医薬保健研究域 小児科)

8:40 AM - 10:40 AM

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## [AJS-01] Screening Models from The Children's Hospital of Philadelphia for Conditions Associated with Sudden Cardiac Death

○Victoria L. Vetter (Professor of Pediatrics The children's Hospital of Philadelphia Perelman School of Medicine at the University of Pennsylvania)

Background: Screening for conditions associated with sudden cardiac arrest in the United States (US) is aimed at high school athletes in most states and utilizes a preparticipation history and physical form. Data from other countries that use electrocardiographic (ECG) screening have demonstrated identification of children and adolescents with undiagnosed conditions that predispose to sudden cardiac death or arrest with increased sensitivity compared to history and physical examination (H&P) alone. Mass screening of school children for cardiovascular disease using an ECG has been mandatory in Japan in the 1st, 7th, and 10th grades since 1973, indicating a greater sensitivity of ECG screening compared to the H&P. Italian data have shown that the incidence of sudden cardiac arrest has decreased significantly after implementation of an electrocardiographic-based screening program including history and physical exam.

Methods: We reviewed evidence on sudden cardiac arrest or death in the young and screening for SCA in the literature and assessed concerns and barriers. We conducted field evaluations of several ECG screening models: a pediatric cardiology clinic/medical office, community/school-based settings, and pediatricians' offices.

Results: We describe a number of screening models used in the US, the resources needed for their implementation, and the outcomes from those screenings.

Conclusions: We recommend a feasible and currently applicable best practice model using ECG screening to be considered for use in the US while additional data are being collected in an attempt to implement a preventive public health initiative that can be tested and modified going forward.

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## [AJS-02] Screening for sudden cardiac death in the young: Useful tool or wishful thinking

○Jan Janousek (Children's Heart Center, University Hospital Motol Prague, Czech)

Sudden cardiac death (SCD) in the young is a rare event. It occurs in 1.1/100 000 person-years between 1 – 18 years of age and 2.8/100 000 in a population

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## [AJS-03] Heart Examination and Sudden Cardiac Death

○Mei-Hwan WU (Superintendent, National Taiwan University Children's Hospital Taipei, Taiwan)

Sudden cardiac death in children is rare, but devastating. The annual incidence in pediatric population beyond infancy is estimated from 0.8 to 6.2 per 100,000. The scenario includes 1) previously known, diagnosed heart disease, 2) previously diagnosed or more likely unrecognized, undiagnosed heart disease (structural heart diseases, WPW syndrome, channelopathy, etc) and 3) without an underlying heart disease (commotio cordis, drug abuse, etc).

A general school survey or athlete's pre-participation survey is often applied to detect the undiagnosed risk of SCD during school activities. Recommended modalities include history taking or questionnaire, physical examination (sometimes aided by phonography) and EKG (4- versus 12-leads). Echocardiography is generally done at referral. Unlike "typical" screening programs that value detecting those who may have the disease (ie, sensitivity), the school survey, when phenotypic prevalence of the diseases with risk of SCD is low, prioritizing specificity over sensitivity can improve the positive predictive value while not affecting the negative predicting value.

Data concerning the efficacy of SCD reduction by cardiac screening are still limited, and mostly limited to pre-participation athlete screening. The pre-participation screening in Italy, which requires physician-led screening with history, physical, and ECG, revealed a 89% absolute risk reduction in SCD risk for competitive athletes, such that the total SCD risk for screened athletes is now comparable to that of contemporary, age matched non-athletes. As for the general school survey, the incidence of identifying disease with SCD risk was 3.47/1000000 from Taipei survey (EKG). But, the risk reduction during the school activities remains still unclear.

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## [AJS-04] 学校心臓検診と突然死予防

○太田 邦雄 (金沢大学医薬保健研究域 小児科)

金沢大学病院は金沢市(2015年現在人口約46万人、15歳未満人口13.5%)とその周辺市町村の学校心臓検診精密検査機関である。金沢市では、2006年から2015年までの10年間に、小中学校1年の計75,610名に心臓検診が行なわれた。精密検査の結果、心房中隔欠損症2名のほか、運動制限が必要な新規診断例は20名を数え、そのうち2名が肥大型心筋症(HCM)、17名がQT延長症候群(LQTS)であった。

小中高校1年生に対する心臓検診が1995年に法的に義務付けられて20年余が経過した。この間幸いにも金沢市では小・中学校管理下での児童生徒の突然死の報告はない。全国的にも、学校管理下における突然死は近年減少傾向にある。このことは、心臓検診がHCMやLQTSなど突然死を起こす疾患の管理に役立っていることを示唆する。一方自動体外式除細動器(AED)の学校配備は急速に進み、これに伴って児童生徒の心原性院外心停止(OHCA)の転帰改善が報告されている。

2005年から2009年の5年間に全国で発生した小中学生の心原性OHCAについて行われた研究では、58例が登録された。学校内発症例は32例(55%)、学校外発症例は26例(45%)であった。学校内は学校外に比べ、バイスタンダーAED施行率が高く(38% vs 8%,  $p=0.01$ )、社会復帰率が良好であった(69% vs 35%,  $p=0.02$ )。発生場所は運動場、プール、体育館で8割を超えた。最終診断はLQTSとHCMが合わせて約3割を占めた。両疾患は学校心電図検診でスクリーニング可能であるが、見逃し例もある。さらに特発性心室細動や冠動脈奇形は安静時心電図では抽出できない。従って"児童生徒の突然死ゼロ"を目指すには、心停止例の解析から得られる情報に基づいた学校救急体制の構築と学校心臓検診の精度改善にむけたフィードバックが必須である。