出國報告（出國類別：國際會議）

歐洲心臟學會(ESC) 2019 年會

（ 2019 European Society of Cardiology Congress ）

服務機關：心臟血管中心
姓名職稱：謝育整/主治醫師/科主任
派赴國家/地區：法國巴黎
出國期間：**108** 年 **08** 月 **30** 日至 **108** 年 **09** 月 **06** 日
報告日期： **108** 年 **09** 月 **17** 日

摘要（含關鍵字）

參與 2019 法國巴黎心臟學會年會，與各國學者交流、學習，並在年會期間，與其他國家學者探討在治療性低溫下使用 Levosimendan (鈣離子增敏劑)可以抑制動作電位的延長相關研究結果。

Background:

Therapeutic hypothermia (TH) increases the susceptibility to ventricular arrhythmias (VA) by prolonging action potential duration (APD) and facilitating arrhythmogenic spatially discordant alternans (SDA). The calcium sensitizer levosimendan has been reported to shorten APD by enhancing ATP-sensitive K current. We hypothesized that levosimendan might shorten the already prolonged APD during TH, decreasing the SDA threshold, and prevent the occurrence of VA.

Methods:

Langendorff-perfused isolated rabbit hearts were subjected to 15-min TH (30°C) followed by 30-min treatment with levosimendan (0.5 μM, n=9) or vehicle (n=8). Using an optical mapping system, epicardial APD was evaluated by S1 pacing. SDA threshold defined as the longest PCL that induce SDA phenomenon. Ventricular fibrillation (VF) inducibility was evaluated by burst pacing for 30 s at the shortest PCL that achieved 1:1 ventricular capture.

Results:

Levosimendan shortened the ventricular APD (PCL 300 ms, from 229±9 ms to 211±18 ms, p=0.02) and decrease the SDA threshold (from 327±88 ms to 311±68 ms, p=0.001) during TH. The VF inducibility was decreased by levosimendan from 39±30% at 30°C to 14±12% with levosimendan. In control hearts, the APD (p=0.75), SDA threshold (p=ns) and VF inducibility (p=0.12) were not changed by vehicle during TH.

Conclusion:

Levosimendan might protect the hearts against VA during TH by shortening the APD and decreasing SDA threshold. Enhancing ATP-sensitive K current with levosimendan during TH might be a novel approach to prevent VA during TH.

Keywords:

Alternans; Action potential duration, Hypothermia; Optical mapping; Levosimendan

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一、 目的

2019年8月30日至9月4日，歐洲心臟學會2019年會（2019 European Society of Cardiology Congress）於法國巴黎舉辦。職前往參加大會並發表在本院進行的心律不整基礎研究。

二、 過程

1. 職於2019年8月29日啟程前往法國巴黎參加世界規模最大的心臟學會。該學會於舉辦年會期間，與會的人數多達三萬人以上，是全世界參與人數最多，國家數最多的交流平台。各國學者無不希望在此盛會中互相交流、學習。

2. 職進行的基礎研究是：探討在治療性低溫下使用 Levosimendan (鈣離子增敏劑) 可以抑制動作電位的延長，並防止心律不整的發生。該研究現象為國內外首次發現，發表論文期間，也有其他國家對此研究有興趣的學者共同交流討論。

3. 會議期間，職在聆聽別人的研究時，意外發現本院先前的研究也被其他學者所引用。正所謂資訊發達的時代，任何研究都可能被別的團隊參考、引用，共同促進科學的進步。

三、 心得

藉由這次活動，職可以在專業研究領域上與其他國家的學者交流學習，希望對本院的研究水準有所提昇。同時，此次大會中也發表包括糖尿病治療指引在內的五大治療指南，對於臨床照護病患也有重大助益。

四、 建議（包括改進作法）

希望未來仍能有這樣的機會持續與國外交流，提昇我們研究的質與量，共同為科學的發展貢獻心力。

五、 附錄：會議相關海報及照片

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Abstract Presentation Agreement Form

*denotes a mandatory field

Agreement form submitted on **30 April 2019**

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Abstract Information

Number:	87276
Title:	Levosimendan shortens action potential duration, decreases alternans threshold and prevents ventricular arrhythmia during therapeutic hypothermia in isolated rabbit hearts
Evaluation Topic:	36.3.4 - Basic Science - Cardiac Diseases: Arrhythmias
Final Category:	
Format:	**Poster Presentation**

Abstract Authors

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Session Information

Number:	303	Session Title:	Poster Session 3
Session Date:	01 Sep 2019	Session Time:	14:00 - 18:00
Location:	Posters - Poster Area		

Posters to be on display from 14:00 - 18:00 (Set up 13:30 - Removed 18:00). Presenter must be by the poster between 15:45 and 16:35 for posters viewing time. To find your poster location, look for its Final Programme Number on the boards in the Poster Area. Posters not on display during the official viewing time will be considered as "not presented/No-show". The abstract will therefore be removed from the congress publications (online SP&P and Mob App) and the certificate of presentation will not be delivered.

Presenter Information (Presenter with several abstracts in the same oral session should choose a different presenter for each presentation.)

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Levosimendan Shortens Action Potential Duration Decreases Alternans Threshold and Prevents Ventricular Arrhythmia during Therapeutic Hypothermia in Isolated Rabbit Hearts

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Background

- Therapeutic hypothermia (TH) increases the susceptibility to ventricular arrhythmias (VA) by prolonging action potential duration (APD) and facilitating arrhythmogenic spatially discordant alternans (SDA).
- The calcium sensitizer levosimendan has been reported to shorten APD by enhancing ATP-sensitive K current.
- We hypothesized that levosimendan might shorten the already prolonged APD during TH, decreasing the SDA threshold, and prevent the occurrence of VA.

Methods

- Langendorff-perfused isolated rabbit hearts were subjected to 15-min TH (30°C) followed by 30-min treatment with levosimendan (0.5 μM, n=9) or vehicle (n=8). (Figure 1)
- Using an optical mapping system, epicardial APD was evaluated by S1 pacing.
- SDA threshold defined as the longest PCL that induce SDA phenomenon.
- Ventricular fibrillation (VF) inducibility was evaluated by burst pacing for 30s at the shortest PCL that achieved 1:1 ventricular capture.

Results

- Levosimendan shortened the ventricular APD (PCL 400 ms, from 272.1±7.6 ms to 252.1±19.7 ms, p=0.02) and decrease the SDA threshold (from 327±88 ms to 311±68 ms, p=0.003) during TH. (Figure 2, 3)
- The VF inducibility was decreased by levosimendan from 39±30% at 30°C to 14±12% with levosimendan. (Figure 4)
- In control hearts, the APD (p=ns), SDA threshold (p=ns) and VF inducibility (p=0.12) were not changed by vehicle during TH. (Figure 3-6)

Conclusion

- Levosimendan might protect the hearts against VA during TH by shortening the APD and decreasing SDA threshold.
- Enhancing ATP-sensitive K current with levosimendan during TH might be a novel approach to prevent VA during TH.

Figure 1.

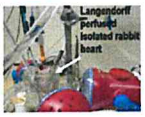


Figure 2.

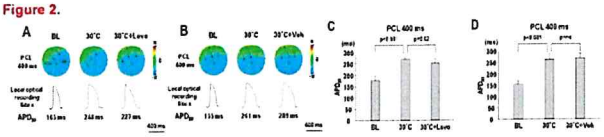
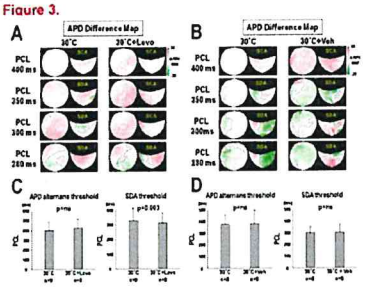


Figure 3.



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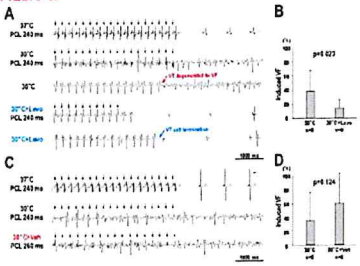

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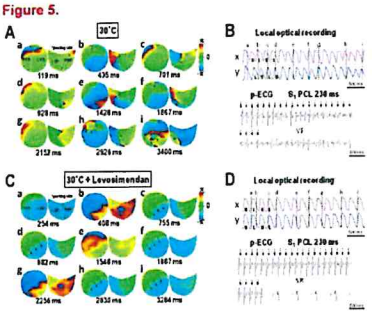

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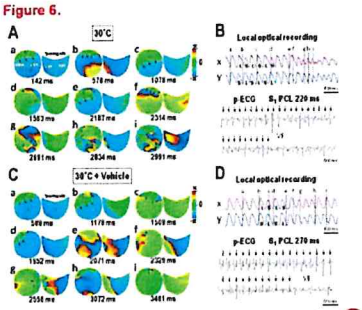

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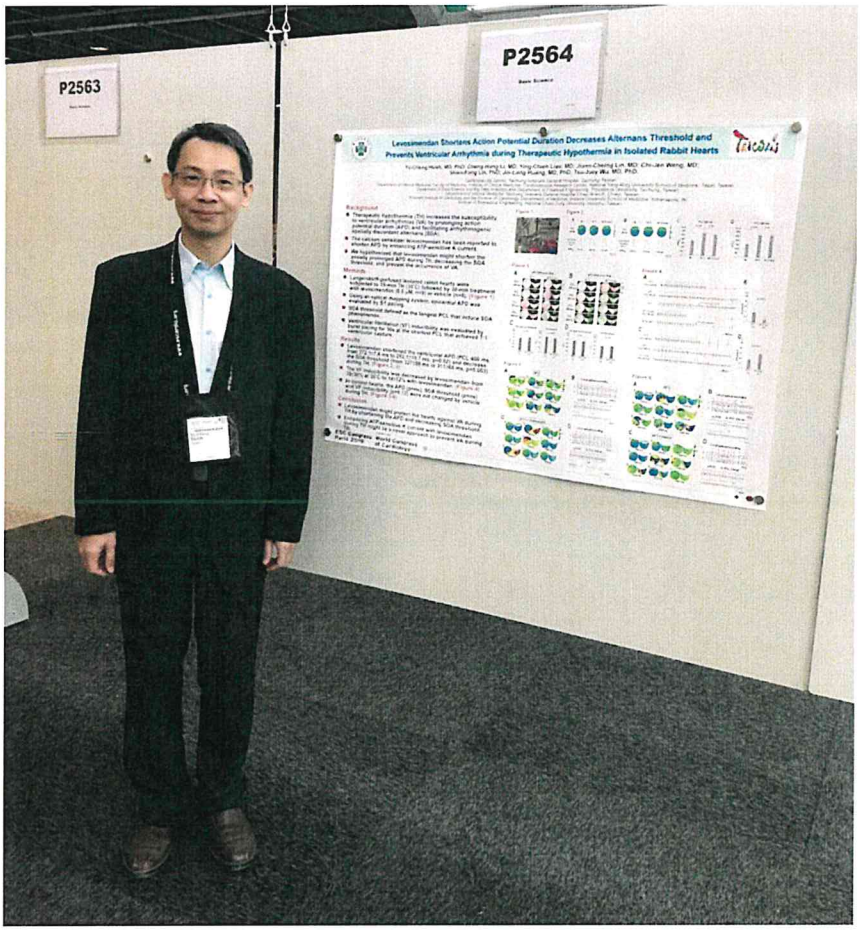
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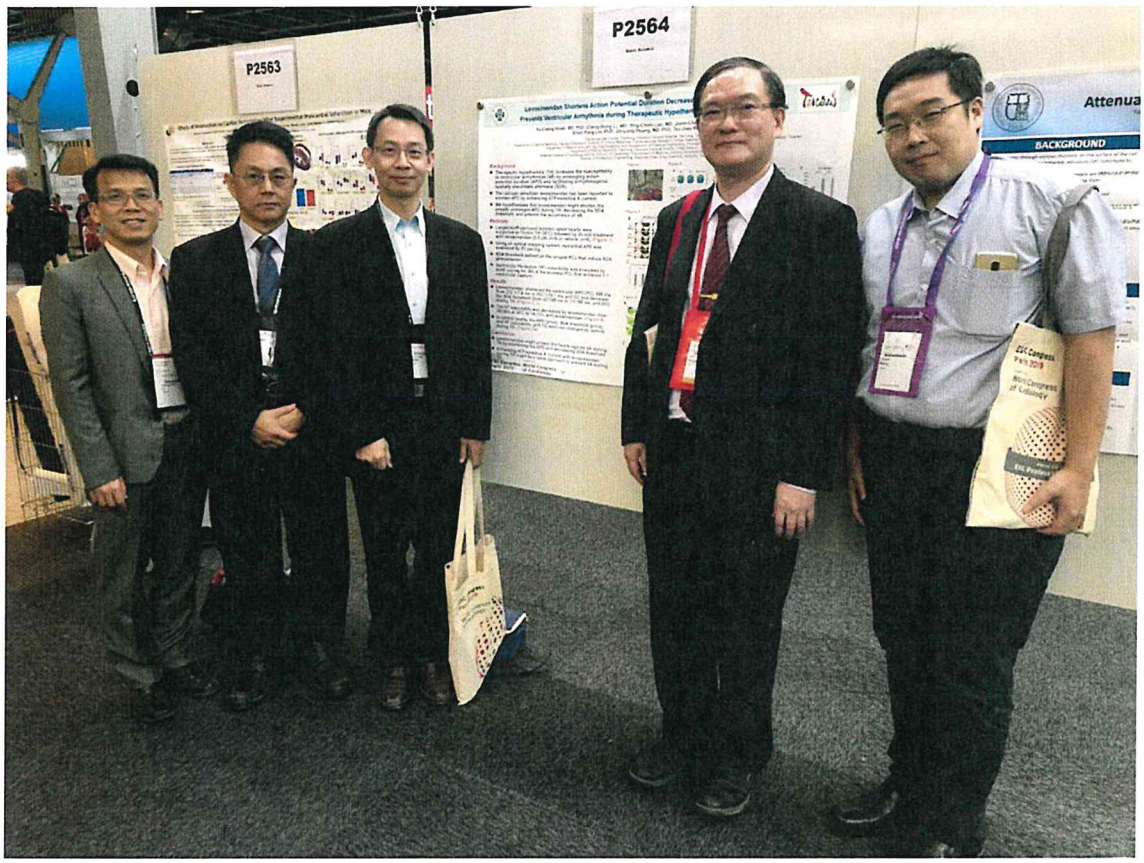
Levosimendan Shortens Action Potential Duration Decreases Alternans Threshold and Prevents Ventricular Arrhythmia during Therapeutic Hypothermia in Isolated Rabbit Hearts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