Aim: To characterize behavioural and cardiorespiratory changes in a new, intermittent low-level lead exposure animal model.

Introduction: Lead (Pb) is a cumulative toxic metal affecting all body systems that are particularly vulnerable during developmental phase. Permanent lead exposure has been defined as a cause of behavioural changes, cognitive impairment, sympathoexcitation, tachycardia, hypertension and autonomic dysfunction. However, no studies have been performed to describe a new, intermittent low-level lead exposure profile, that has been increased in the past years.

Methods: Foetuses were intermittently (Pbl) exposed to water containing lead acetate (0.2%, w/v) throughout life until adulthood (28 weeks of age). A control group (without exposure, CTL) was matched in age and sex was used. At 26 weeks, behavioural tests were performed for anxiety (Elevated Plus Maze Test) and locomotor activity (Open Field Test) assessment. Blood pressure (BP), electrocardiogram (ECG), heart rate (HR) and respiratory frequency (RF) rates were recorded at 28 weeks of age. Baroreflex gain (BRG) and chemoreflex sensitivity (ChS) were calculated. Student’s T-test was used (significance $p < 0.05$) for statistical analysis.

Results: An intermittent lead exposure causes hypertension (increased diastolic and mean BP), increased RF, decreased baroreflex function and increased ChS, without significant changes in HR, when compared to CTL group. Regarding behavioral changes, the intermittent lead exposure model showed an anxiety-like behaviour without changes in locomotor activity.

Conclusion: Intermittent low-level lead exposure induces changes on the cardiorespiratory profile characterized by hypertension, carotid chemosensitivity and baroreflex impairment. According to behavioural tests results, this study also shows that the exposure to lead during developmental phases causes anxiety in adult animals without locomotor activity impairment.

In summary, this study brings new insights on the environmental factors that influence nervous and cardiovascular systems during development, which can help creating public policy strategies to prevent and control the adverse effects of Pb toxicity.

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PS120

Antihypertensive effects of two novel dihydropyridine derivatives

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Aim: Treatment of hypertension.

Introduction: Mebudipine and dibudipine are two novel derivatives of dihydropyridine (DHP) Ca2+ channel blockers. Previous studies have shown that these two compounds have relaxant effects on vascular smooth muscles. In addition, DPHs are able to reduce contraction force of cardiac muscle in rat. In this study we decided to evaluate the antihypertensive effects of these two novel DHPs in hypertensive rat.

Methods: Male Sprague-Dawley rats were used in the study (8–10 weeks old). The rats were randomly divided to 4 groups of 10 rats (one control and 3 test groups). Blood pressure was measured by Tail cuff method. Left kidneys of the rats were removed by nephrectomy and sodium chloride 1% was added to the drinking water of animals and desoxycorticosterone acetate 20 mg/kg (SC) were injected twice a week. During and after 4 weeks, blood pressure of animals was evaluated to confirm the hypertension. Blood pressure of the animals was measured before i.p. injection of mebudipine and dibudipine (1–8 µmole/kg) and 2 min after the drug administration.

Results: Mebudipine and dibudipine significantly reduced the systolic blood pressure. Mebudipine was more effective than dibudipine and nifedipine in hypertensive animals and has significant results.

Conclusion: Previous studies showed that i.p. injection and oral usage of mebudipine and dibudipine decrease systolic hypertension in normotensive animals, on the other hand vasodilation effects of DHPs have been proved on aorta. Both novel drugs showed significant reduction in systolic blood pressure in hypertensive animals and mebudipine was more potent than dibudipine and nifedipine (as a standard drug uses). It is remarkable that, two new DHPs have similar efficacy and safety profile, but have higher efficacy compared to nifedipine in present study. The brilliant point is that DHPs as calcium channel blockers are more effective in hypertensive animals compared to normotensive animals.

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PS062

Biological processes of polyphenols in the cardiovascular system: A bioinformatics approach

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Aim: In this study, we aimed to evaluate the cardiovascular system-related biological processes (BP) modulated by polyphenols in rodents and humans, and to verify which of them are specie-
specific, in order to understand which outcomes for cardiovascular diseases (CVD) could be translated from animal to human studies.

**Introduction:** CVD stand as a great cause of morbi-mortality worldwide and polyphenol-rich diets have been associated with improved cardiovascular risk profiles. Although rodent models have been a resourceful means of understanding the CVD mechanisms and possible outcomes of the use of polyphenols in that context, most experimental models do not fully reproduce human CVD.

**Methods:** Database searching was carried out on PubMed and Google Scholar using specific keywords concerning CVD, retrieving close to 300 publications. After excluding irrelevant results, proteome data was organized in Excel® spreadsheets and the Cytoscape platform, ClueGo + CluePedia and Venny 2.1.0 were used to explore the biological processes influenced by flavonoids in the approached CVD.

**Results:** This study was mainly focused in the species Rattus norvegicus and Homo sapiens and in flavonoids, a polyphenol subgroup. Only about 5% of the BP influenced by flavonoids were common to both species and they were mostly related to the maintenance of blood pressure and the fatty acid metabolic process. Nevertheless, these effects were accomplished through different proteins/pathways and different subgroups of flavonoids.

**Conclusion:** Our research highlights the need for a careful translation of the flavonoids’ effects observed in rat models to clinical trials, since different proteins and subgroups of flavonoids mediated the observed actions. Though this type of studies can provide insights to help choosing the most adequate polyphenols as preventive approaches or therapies for human CVD, further investigation should be performed to clarify the described effects. Besides, pharmacokinetic aspects of the flavonoids’ action should also be considered when planning clinical trials.

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