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ORIGINAL RESEARCH COMMUNICATION

Ceramide Mediates Acute Oxygen Sensing in Vascular Tissues

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Abstract

Aims: A variety of vessels, such as resistance pulmonary arteries (PA) and fetoplaental arteries and the ductus arteriosus (DA) are specialized in sensing and responding to changes in oxygen tension. Despite opposite stimuli, normoxic DA contraction and hypoxic fetoplaental and PA vasoconstriction share some mechanistic features. Activation of neutral sphingomyelinase (nSMase) and subsequent ceramide production has been involved in hypoxic pulmonary vasoconstriction (HPV). Herein we aimed to study the possible role of nSMase-derived ceramide as a common factor in the acute oxygen-sensing function of specialized vascular tissues. **Results:** The nSMase inhibitor GW4869 and an anti-ceramide antibody reduced the hypoxic vasoconstriction in chicken PA and chorioallantoic arteries (CA) and the normoxic contraction of chicken DA. Incubation with interference RNA targeted to SMPD3 also inhibited HPV. Moreover, ceramide and reactive oxygen species production were increased by hypoxia in PA and by normoxia in DA. Either bacterial sphingomyelinase or ceramide mimicked the contractile responses of hypoxia in PA and CA and those of normoxia in the DA. Furthermore, ceramide inhibited voltage-gated potassium

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Bladder Cancer in Spain 2011: Population Based Study

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Purpose: We estimate the annual incidence of bladder cancer in Spain and describe the clinical profile of patients with bladder cancer enrolled in a population based study.

Materials and Methods: Using the structure of the Spanish National Health System as a basis, in 2011 the AEU (Spanish Association of Urology) conducted this study with a representative sample from 26 public hospitals and a reference population of 10,146,534 inhabitants, comprising 21.5% of the Spanish population.

Results: A total of 4,285 episodes of bladder cancer were diagnosed, of which 2,476 (57.8%) were new cases and 1,809 (42.2%) were cases of recurrence, representing an estimated 11,539 new diagnoses annually in Spain. The incidence of bladder cancer in Spain, age adjusted to the standard European population, was 20.08 cases per 100,000 inhabitants (95% CI 13.9, 26.3). Of patients diagnosed with a first episode of bladder cancer 84.3% were male, generally older than 59 years (81.7%) with a mean \pm SD age of 70.5 \pm 11.4 years. Of these patients 87.5% presented with some type of clinical symptom, with macroscopic hematuria (90.8%) being the most commonly detected. The majority of primary tumors were nonmuscle invasive (76.7%) but included a high proportion of high grade tumors (43.7%). According to the IUTP (International Society of Urologic

Abbreviations and Acronyms

BC = bladder cancer
BCG = bacillus Calmette-Guérin
BMI = body mass index
CIS = carcinoma in situ
MMC = mitomycin C
NMIBC = nonmuscle invasive bladder cancer
TURBT = transurethral bladder tumor resection

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