Is gender meaningful for research? Testimony..

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WE HAVE STUDIES OF FRUIT FLIES, MICE, HAMSTERS, FROGS, MONKEYS AND MEN WITH THIS CONDITION—BUT MEDICAL RESEARCH USING WOMEN AS SUBJECTS JUST NEVER OCCURRED TO ANYBODY.
Prototype of normalcy

White men, 1,80 m, 70 Kg, Wanted for clinical research

- Historical blindness
- Hiatus in biomedical research
- Need to study homogenous samples filled medical libraries of datas on white men
Sex bias in research on mammals

- Despite well-established sex differences in pharmacokinetics and pharmacodynamics, and attempts to draw attention to sex-dependent drug effects:
  - ♂ majority of rodent researchers continue to use males exclusively in their drug studies
  - ♂ female rats are neglected in biomedical research
  - Review: male bias was evident in 8 disciplines (prominent in neuroscience), with single-sex studies of male animals outnumbering those of females 6 to 1.
The « gender gap » in human research

- Women remain under-represented in biomedical research
  - Inhomogenous group
  - Real and perceived challenges of “controlling” for cyclic hormonal effects
  - Paternalistic centuries-old concept of protecting women and children from harm, expanded to a virtual ban on all women in clinical trials
- Medical research in women had a focus similar to that of popular women’s magazines: breasts and sex
- The datas observed in male subjects are extrapolated in females.
- No specific recommendations for women until recently
- Asymmetry of knowledge in pathophysiology and negatively impacts the health of women

Gender bias in cardiovascular research

1st cause of death in women is cardiovascular disease 54% (23% cancer)

- Gender related analysis is reported in only 25% of CV studies
- False myths, breast angina is benign in women, underestimation of risk

Worse outcomes for women in acute myocardial infarction

- Atypical and delayed presentation
- More comorbidities and older age
- Treatment bias—less invasive procedures and revascularisation therapies. Inferior secondary prevention
- Biological bias—different response to anti-platelet agents and smaller vessels
- Assessment bias—less access to intervention and more delays in referrals

European Heart Journal Cardiovascular Pharmacotherapy 2017,1. Heart 2016;102:1142
Starting my clinical research...interested in renal sodium handling and the female hormonal status.

Salt Desert in Bolivia (Salar de Ujuni)

I realized the gender gap and designed studies to assess the link between the sex female hormones on various hormonal states (2 phases of menstrual cycle, contraceptives, menopause, pregnancy), and the renal hemodynamics, the blood pressure regulation and the salt-sensitivity in women

Pechère Bertschi et al, Clinical Science 2000; 98:697  
Endogenous and exogenous effect of sex female hormones on pressure-natriuresis curve in women

$U_{Na-V}$ (mmol/d)

- follicular
- luteal
- contraceptive
- menopause
- preeclampsia

24h mean blood pressure (mmHg)

Martillotti, Pechère-Bertschi, Hypertension 2013; Ditisheim, Pechère, Hypertension 2017 submitted
Nocturnal renal escape of sodium in women with orthostatic hypotension

A negative « picture » of hypertension..

Preeclampsia and hypertensive disorders of the pregnancy

In HUG: specific consultation on hypertensive troubles of pregnancy

THANK YOU FOR YOUR ATTENTION!