CHAPTER 6

ENDOCRINE DISRUPTION AND SYSTEMIC HEALTH: HORMONAL IMBALANCES DUE TO CLIMATE CHANGE

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INTRODUCTION

Climate change is recognized as the greatest global health challenge of the 21st century (1). Climate change occurs because of the increase in the concentration of greenhouse gases, which trap solar radiation in the Earth's atmosphere rather than reflecting it back into space. Rising temperatures due to global warming lead to glacier melting, reduced snow and ice cover, rising sea levels, increase in extreme weather events, higher ultraviolet radiation exposure, and the accompanying effects of drought, desertification, and natural disasters (2,3). The most abundant greenhouse gases in the Earth's atmosphere include water vapor, carbon dioxide (CO_2), methane, nitrous oxide (N_2O), ozone, and fluorinated gases, including chlorofluorocarbons and hydrofluorocarbons (4).

The impact of global climate change on human health can be direct or indirect (3). The Intergovernmental Panel on Climate Change (IPCC) has emphasized the critical need to limit the rise in global average temperature to within 1.5°C above pre-industrial levels (5). It is estimated that a 2°C increase could lead to 100 million premature deaths worldwide in the 21st century (6).

During extreme weather events, hazardous chemicals and water- and vector-borne pathogens can potentially spread in the environment (7,8). High levels of air pollution exposure can increase the risks of endocrine, metabolic, and neurological disorders; reproductive diseases; cancer; and mortality (1). Air pollution negatively affects fertility in both women and men. A decrease in sperm motility has been observed within two to three months following exposure to air pollution. In addition, ambient temperature around the testes is vital for the production and quality of sperms (2). Vitamin D deficiency is another consequence of climate change involving air pollution (9).

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