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Psychosomatic aspects of arterial hypertension in women

Arterial hypertension is one of the most widespread diseases in the world, and in many countries it is also the most frequent cause of adult mortality. According to WHO data, this problem refers to about 20% of adult population (7). That is why it is also numbered among social diseases. It is believed that the correct values of systolic and diastolic blood pressure are below 120 mmHg and below 80 mmHg, respectively. Values between 120–139 and 80–89 mmHg are recognized as a state of prehypertension, while values of arterial blood pressure above 140/90 mmHg are diagnosed as arterial hypertension (10).

Values of blood pressure change with age. In highly developed countries, arterial blood pressure rises with age both in women and in men. People aged 30–65 experience a rise of 20 mmHg in systolic and a rise of 10 mmHg in diastolic arterial blood pressure. It is known that systolic blood pressure rises until the age of 70–80, while diastolic up to the 6th decade of life, after which it slightly decreases. The influence of age on blood pressure differs in both sexes. Young men have higher blood pressure than young women, hence the occurrence of arterial hypertension in men of this age group. With age, blood pressure rises more rapidly in women. That is why in this older age group the disease involves mostly women (11).

In Poland, about 45% of the adult population suffers from arterial hypertension – it afflicts 45% of men and 36–38 % of women. If we compare the values of arterial blood pressure in women before and after menopause, there is a marked rise in blood pressure in the latter group.

Arterial hypertension is a set of regulatory disorders of a complicated, multifactor etiology encompassing genetic conditions, the influence of the environment and some individual factors. Among the individual conditions, the most important are: the activity of the sympathetic system, the renin-angiotensin-aldosterone system, hyperinsulinemia and insulin resistance, obesity of abdominal type, intense psychical reactivity, and hormonal disorders, including those occurring during the period of menopause.

Unfavourable environmental conditions play a large part in the development of hypertension, these include e.g. tobacco smoking, excessive consumption of sodium or alcohol, noise, stressful situations, and the type of the nervous system reaction. In these conditions, the cerebral cortex and subcortex equilibrium is disturbed, the inhibiting activity of the cerebral cortex stops and there arises a state of increased tension of vaso-motor centres leading to increased blood pressure (2). The pituitary gland is also stimulated and a hormonal chain of glicocorticoids and mineralocorticoids is set in motion with sodium retained in the organism. As a result of these changes, weaker and weaker environmental stimuli lead to a state of arterial spasm.

Arterial hypertension is a psychosomatic disorder, i.e. its etiology is strongly linked with improper adaptation to stress. Not infrequently has it been observed that the beginning of hypertension was connected with a death anniversary of a person with whom the patient had been related (6).

Biological stress, according to Selye's theory, is a nonspecific part of the organism's response to any demand; every time the organism reacts to different impulses in a universal manner. Factors which are the source of stress are called stressors. The general, non-specific reaction of the organism takes place as an adaptation syndrome which can be divided into three stages: the alarm reaction stage with a shock phase, which embraces the initial direct impact of the harmful factor on the organism, followed by a phase of counteraction to the shock with defensive reactions; the stage of resistance, i.e. a period of adaptation; the stage of exhaustion characterized by a loss of the defensive abilities of the organism.

In the first period, under the influence of a stressor, large quantities of ACTH are secreted from the pituitary gland, and then glucocorticoids are intensively produced in the adrenal gland cortex. The stage of resistance is a period in which the organism adapts to the continuous activity of the stressor. It is then that the general resistance of the organism to the pathogenic factor increases. The organism tolerates the activity of harmful factors relatively well. If the activity of the stressor persists, the stage of resistance changes into the stage of exhaustion of the adrenal gland cortex, which leads to the decrease in the general immunity of the organism and to a disturbance of its physiological functions (8, 12).

Stress can also be defined in a different manner as a sense of the danger of losing control over one's own life (9). It may originate from different sources: the external environment, e.g. natural disasters such as an earthquake; it may also have an endogenous cause, e.g. depression. Stress may also result from a given individual's relation to the surrounding environment, e.g. stress at work which stirs up negative emotions (9).

If the stressful experience is intensive or repeats many times, it may lead to such consequences as psychosomatic disorders, for instance, arterial hypertension (2, 6). It has also been proved that there are differences between the manner healthy people and those with psychosomatic disorders react to stress. In particular, healthy people assume an active attitude, they try to find a solution and overcome the obstacles, while the sick have the tendency to resign and seek help (2, 6, 9).

The development of psychosomatic diseases is inseparably connected with personality traits and behavioural conditions. There exists the notion of the type A behaviour pattern. This behaviour engages an individual in a constant struggle to achieve the greatest number of goals (often indistinctly defined) in the shortest possible time. If necessary, type can overcome the resistance of other people, things or circumstances. Such individuals are highly competitive; they desire acknowledgement and promotion (14). This type of behaviour includes a strong need of achievement, a tendency to dominate, and aggressiveness. The formal features of the type A behaviour pattern are a high dynamism of behaviour, energy showing in action, haste and impatience. It has been proved that the type A behaviour pattern can increase the risk of developing such illnesses as cardiac ischemia, arterial hypertension, and alimentary system disorders (14).

Patients with idiopathic hypertension are characterized by prolonged and, in most cases, unconscious conflicts connected with expressing enmity, aggression, resentment, fury, mutiny, ambition, or dependence. Defending against these conflicts, the organism triggers psychological mechanisms which lead to the development of negative personality traits (6). An example of this is excessive self-control, aimed at concealing or disguising anger. It has been proved that prolonged suppression of aggression combined with anxiety considerably increases blood pressure.

Discussing the problem of arterial hypertension, one should mention the notion of cardiovascular reactivity – CVR, which can be defined as changes in the reactivity of the cardiovascular system between the state of rest and man's everyday activity under the influence of stressful situations. It has been proved that an increase in CVR in stressful situations is a psycho-physiological reaction to danger (3). Much of this research has been conducted on women. It has been shown that type A women – impatient, aggressive, hostile to their environment, committed to work and competitive – have a higher CVR coefficient and higher arterial blood pressure than type B. This concerns the increase in the value

of systolic and diastolic blood pressure, as well as mean arterial blood pressure. The stress mechanism consists in increasing the secretion of epinephrine and norepinephrine, which cause a heightening of blood pressure to a level high enough to lead to changes in the inner arterial wall.

A hypothesis has also been put forward that states of continual conflict with the environment, aggression and anxiety may permanently increase arterial blood pressure. Anxiety, measured on the Framingham Tension Scale, appears to be an important psychological factor predisposing people to the development of hypertension in older age (13).

Apart from psychological factors, hypertension is also influenced by environmental factors. Here belong a person's job, psychological predisposition to the work done, the level of knowledge, and support from colleagues. It has been demonstrated that people, and especially women, holding a high position and feeling job strain have higher values of blood pressure (1). Job strain is defined here as a combination of high psychological demands put on an employee with a simultaneous low decision latitude at work. It has also been proved that married women who have children have a higher value of blood pressure than single women. However, such a correlation has not been found in the case of married and single men (1). Authors suggest that it happens so because working women may be unable to unwind after work as the requirements they have to meet cause an internal conflict in them, which lasts both at home and at work. At the same time, they claim that family members can have a beneficial influence on blood pressure as, through warm and passionate relations in the family, they alleviate job strain.

Another matter that should be mentioned is the influence of estrogens on the values of arterial blood pressure. One can observe an increase in the frequency of occurrence of this illness in women after the age of 50, that is the statistic age of menopause. It is probably the influence of the lowering of estrogen levels.

The mechanism of estrogen activity consists in the widening of blood vessels due to the blocking of affluence of calcium ions to myocytes. Apart from that, estrogens increase the secretion of PGI₂ prostacyclin by the vessel endothelium, which prevents intravascular platelet aggregation, activates the fibrinolytic system, and widens the vessels. Additionally, they increase the release of nitric oxide. In sum, estrogens lower the peripheral resistance, increase the sensitiveness of arteries and decrease arterial blood pressure (5).

Some authors suggest, however, that other factors too can influence the increase of the frequency of occurrence of arterial hypertension in the postmenopausal age. These include an increase in body mass, reduced physical activity, states of fear and depression caused by retirement and the accompanying sense of rejection.

The influence of postmenopausal replacement therapy on the values of arterial blood pressure is not entirely clear (4). It has been proved that oral contraceptives increase the frequency of arterial hypertension 2–3 times. Under the influence of synthetic estrogen, the production of angiotensinogen is intensified and the activity of the renin-angiotensin system increases. However, after a reduction of the hormone content in the contraceptive pill, its influence on the risk of hypertension is not large. The risk grows considerably in the case of obese smoking women over 35 years of age (11).

As for the postmenopausal replacement therapy, there are contradictory reports concerning its influence on the values of arterial blood pressure. Estrogens applied abenterically, percutaneously or nasally, do not increase the production of angiotensinogen and renin activity of plasma, as opposed to those applied orally (4). Adding progestogens to estrogens diminishes the diastolic vascular activity of estrogens even by 50%. Because of that, it was believed that estrogen-progestogen therapy was less beneficial than treatment with estrogens alone (5). This, however, has not been confirmed by American epidemiological research, which showed that a combined therapy does not decrease the cardioprotective activity of estrogens (5).

Summing up, it should be stated that psychological stress and personality traits are risk factors in arterial hypertension. In spite of the fact that we do not have a full knowledge of the mechanisms starting the reaction chain, the awareness of these factors can help us decrease the risk of the development of the disease or hinder its progression.

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SUMMARY

Arterial hypertension is one of the most widespread diseases in the world, both in women and men. In Poland, about 45% of the adult population suffers from arterial hypertension – it afflicts 45% of men and 36–38% of women. Arterial hypertension is a set of regulatory disorders of a complicated, multifactor etiology encompassing genetic conditions, the influence of the environment and some individual factors. Being also psychosomatic disorder it is strongly linked with improper adaptation to stress, personality traits and behavioural conditions especially with the type A behaviour pattern. This type of behaviour includes a strong need of achievement a tendency to dominate, and aggressiveness. The type A women – impatient, aggressive, hostile to their environment, committed to work and competitive – have a higher CVR (cardiovascular reactivity) coefficient and higher arterial blood pressure than type B. Some authors suggest that the lowering of estrogen levels in women over the age of 50 increases the frequency of occurrence of arterial hypertension. In spite of the fact that we do not have a full knowledge of the mechanisms starting the reaction chain, the awareness of these factors can help us decrease the risk of the development of the disease or hinder its progression.

Psychosomatyczne aspekty nadciśnienia tętniczego u kobiet

Nadciśnienie tętnicze jest jedną z najbardziej rozpowszechnionych chorób na świecie, zarówno wśród kobiet, jak i mężczyzn. W Polsce około 45% dorosłej populacji cierpi na nadciśnienie, dotyczy ono 45% mężczyzn i 36-38% kobiet. Nadciśnienie tętnicze to zespół zaburzeń regulacyjnych o złożonej, wieloczynnikowej etiologii, obejmującej uwarunkowania genetyczne, wpływ środowiska oraz niektóre czynniki osobnicze. Będąc zaburzeniem psychosomatycznym, jest silnie związane z niewłaściwym przystosowaniem do stresu, cechami charakteru i uwarunkowaniami behawioralnymi, szczególnie wzorem zachowania A, który charakteryzuje się skłonnością do współzawodnictwa, pragnieniem awansu, uznania. Kobiety reprezentujące wzór zachowania A – niecierpliwe, agresywne, wrogo nastawione do środowiska, zaangażowane w pracę i współzawodnictwo – mają wyższy współczynnik reaktywności sercowo-naczyniowej, a zarazem wyższe wartości ciśnienia tętniczego niż kobiety reprezentujące typ zachowania B. Niektórzy autorzy sugerują, że obniżenie poziomu estrogenów u kobiet po 50 roku życia powoduje wzrost częstości występowania nadciśnienia. Mimo że nie do końca znamy mechanizmy uruchamiające ciąg reakcji, znając te czynniki, możemy zmniejszyć ryzyko rozwoju choroby bądź zahamować jej progresję.