

HEADACHE AND PREGNANCY – A MULTIDISCIPLINARY APPROACH

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SUMMARY – A 34-year-old pregnant woman presented for neurologic examination for headache and vision impairment. Neurologically, decreased responsiveness of the right pupil and discrete hemiparesis with positive Babinski reflex were objectively observed. During clinical monitoring, periods of neurologic deficit improvement and exacerbation with alternating lateralization were recorded. The appropriate diagnostic (neuroradiologic) work-up could not be employed because of pregnancy and the patient's refusal to undergo these examinations; therefore, the patient was monitored clinically and by use of methods posing no fetal risk. Upon delivery that proceeded uneventfully, the patient underwent neuroradiologic examinations that revealed an expansive neoplasm in the pituitary region. The patient was operatively treated by transsphenoidal selective adenectomy. Preoperative hormone test findings as well as histology and immunohistochemistry findings confirmed it to be macroprolactinoma of the pituitary gland. The diagnosis and treatment of this patient required team work of a number of different specialties.

Key words: *Pregnancy complications – etiology; Pregnancy complications – diagnosis; Head and neck neoplasms – diagnosis; Pituitary neoplasms – diagnosis*

Introduction

On approaching headaches, it is of utmost importance to determine whether it is a primary headache of functional nature (about 80% of all headaches) or a secondary, symptomatic headache as a sign of organic disease of the brain or surrounding cranial structures^{1,2}. Brain tumors are relatively common, accounting for 10% of all tumors.

Brain tumors are rather difficult to detect because of their localization in the region quite inaccessible by classic or general medicine methods. While growing in a relatively limited osseous cranial space, brain tumors compromise cerebral parenchyma, thus any brain tumor is malignant for its localization irrespective of histologic evaluation (which may prove benign)^{3,4}. Diagnostic work-up is complex and may include invasive methods, while

a coinciding pregnancy makes it even more demanding, requiring team work of various specialists (neurologist, gynecologist, ophthalmologist, neuroradiologist, pain control specialist, etc.).

Case Report

Z. M., a female born in 1968, presented to neurology emergency clinic in the fourth month of gestation, for pulsating headache in the frontoparietal region on the right, accompanied by the feeling of sudden darkening, experienced two days before. The headache was not accompanied by nausea or vomiting, and the pain subsided to 300 mg paracetamol taken *per os*. Objectively, the neurologic status was normal; BP 90/55 mm Hg; EEG recording slightly dysrhythmically altered frontoparietally on the right. Two days before, the patient was seen by an ophthalmologist, with normal vision, fundus and tonus findings. Gynecologic finding was normal. Goldmann perimetry confirmed hemianopic defects of all

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Fig. 1. Brain CT with contrast medium showing expansive neoplasm in the region of sella turcica.

isopters temporally on the right. On the left, I1 and I2 were not recorded. Other isopters were concentrically narrowed to 20-40°. Hospitalization was advised for suspicion of optic neuritis, which the patient declined. In a month, she presented for control neurologic examination. She felt better, reporting no headache or nausea since the last visit, however, she complained of blurred vision. In neurologic status, a sluggish response of the right pupil to light, extension of the great left toe, and subjective feeling of weight in the left extremities when in anti-gravity position were recorded. The patient was explained the need of neuroradiologic work-up and its possibilities as well as the potential maternal and fetal risks. She refused to undergo any radiologic examination; then she revealed it was her second marriage and second pregnancy. She was mother to a healthy daughter from her first marriage, the first pregnancy and delivery being completely uneventful. In her second marriage, she had experienced difficulties with conception and was highly motivated to complete this pregnancy and delivery.

On control examination three months of the initial presentation, the patient felt subjectively better, reporting occasional headache of moderate severity. Control

EEG and funduscopy were within the normal limits. Visual field according to Goldmann was concentrically narrowed. One month later, she was well, with occasional headache. Visual evoked potential suggested left homonymous hemianopia with possible conduction disturbances in the remaining fiber. On neurologic status, the left pupil showed impaired responsiveness, Babinski reflex still positive. Control visual field according to Goldmann indicated bitemporal hemianopia; fundus and EEG were within the normal limits. On the last neurologic control visit, the patient complained of blurred vision on the right eye. Neurologic status was unchanged. Gynecologic finding in the 38th week of gestation was normal.

Due to the unknown nature of the possible pathoanatomical substrate compromising the area of optic chiasm (the possible presence of tumor or aneurysm), fluctuating clinical picture and visual field finding (the possibility of disseminated encephalomyelitis), from the neurologic viewpoint it was advised to ensure delivery completion by a method associated with least physical strain for the patient at an institution with proper diagnostic and therapeutic equipment for the management of possible complications. The patient was referred to Department of Gynecology and Obstetrics, where vaginal delivery proceeded uneventfully. Soon thereafter, the patient underwent the previously prescribed neuroradiologic work-up. Computed tomography (CT) of the brain revealed an expansive hypodense lesion located



Fig. 2. Magnetic resonance of the pituitary showing heterogeneous expansive neoplasm in the region of sella turcica.

parasellarly, measuring 17 mm, which showed marginal opacification upon the application of contrast medium. The finding was interpreted as corresponding to optic glioma or craniopharyngeoma. Magnetic resonance (MR) of the brain showed a cystic expansive neoplasm intrasellarly, with slight suprasellar expansion. According to the neuroradiologist's opinion, craniopharyngeal cyst, less likely Rathke's cyst, and even less likely cystic, partially hemorrhagic adenoma of the hypophysis had to be considered on differential diagnosis, depending on the cyst content.

MSCT angiography indicated a cystically altered hypophysis with cranially lifted sellar diaphragm and reduced chiasmatic cistern width. The inner sellar space was hypodense relative to brain parenchyma, showing almost no imbibition upon contrast application; thus, it appeared to be a case of cystically altered hypophysis, possibly following a hemorrhage and complete hematoma lysis. There was mild compression of the optic chiasm, which was lifted cranially.

The patient was operatively treated by transsphenoidal selective adenectomy. She tolerated the procedure well, and the postoperative course proceeded uneventfully. The preoperative hormone test findings as well as histology and immunohistochemistry findings indicated hypophyseal macroprolactinoma.

Discussion

In the USA, the incidence of central nervous system neoplasms is 10-20 cases *per* 100,000 population. There are no epidemiologic studies assessing the incidence of central nervous system neoplasms in pregnant women. A study based on 1961-1979 tumor registry in the former German Democratic Republic reports on a brain tumor prevalence of 3.6 *per* 100,000 pregnant women, which is higher than expected for female population of this age group^{5,6}. The symptoms and signs are the same as in other population groups, however, pregnancy (especially early) makes timely tumor detection and diagnosis even more difficult. When considering a headache, it is of utmost importance to determine whether it is primary (functional) or secondary (symptomatic) headache consequential to organic disease of the brain or surrounding cranial structures^{1,2}. Symptomatic or secondary headache due to brain tumor is characterized by dull or undifferentiated diffuse pain, usually most severe in the morning. Vomiting that frequently accompanies normal pregnancy in the first trimester, to decrease in frequen-

cy thereafter, usually occurs abruptly, severely and frequently without nausea in case of brain tumor. Clinical manifestations of brain tumors are due to elevated intracranial pressure and local tumor effects consequential to the growth of the neoplasm, development of cerebral edema, obstruction of the cerebrospinal fluid flow, and obstruction of venous circulation⁷. In addition to headache and vomiting, symptoms of impaired cognitive function and vision, varying grade of consciousness disturbances, and occasionally seizures may occur. Visual impairments can be due to edema of the optic nerve papilla, characteristically manifesting as bitemporal (heteronymous) hemianopia caused by compression of the optic chiasm, however, other visual field defects may also occur (central scotoma, homonymous hemianopia). Further compression of the optic chiasm leads to bilateral optic nerve atrophy with amblyopia and respective pupillary areflexia^{8,9}.

Tumors of the hypophysis are categorized according to size as microadenomas (less than 1 cm) and macroadenomas (greater than 1 cm), and according to the hormone they secrete (prolactin, growth hormone, corticotropin, thyrotropin). There also are nonsecretory adenomas. Most of pituitary adenomas are asymptomatic. Prolactinomas are most common, manifesting by galactorrhea, amenorrhea and sterility, whereas neurologic symptoms and signs include headache and visual field defects due to compression of the optic nerve. Enlargement of the hypophysis occurs in healthy women during pregnancy, therefore a previously asymptomatic tumor can also enlarge and cause neurologic deficit. The diagnosis is made by MR imaging of the pituitary region.

During pregnancy, any use of ionizing radiation should be avoided because of its teratogenic effect on dividing cells. The first trimester is a highly sensitive period of pregnancy, when the fetus is most vulnerable to physical effects. Therefore, classic and CT radiologic methods are contraindicated during the first three months of gestation, and their use is only allowed in life-threatening pregnant women when other nonionizing methods cannot ensure appropriate diagnostic outcome. Trials of the possible adverse fetal effects of MR are scarce for ethical reasons, however, there is a general opinion that MR studies should be avoided in pregnancy. The use of paramagnetic contrast agents should also be avoided because they cross the fetoplacental barrier and are secreted into amniotic fluid where they can potentially cause damage¹⁰. Decision on delivery completion

is made individually, and appropriate analgesia contributes to safety of vaginal delivery by reducing the impact of pain on intracranial pressure oscillations.

The case presented points to the crucial role of thorough history, close clinical examination, and need of team work of various specialists, both in the diagnosis and management of such patients, especially during the sensitive period of pregnancy.

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Sažetak

GLAVOBOLJA I TRUDNOĆA – MULTIDISCIPLINSKI PRISTUP

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Opisuje se slučaj 34-godišnje trudnice koja se je u četvrtom mjesecu trudnoće javila neurologu zbog glavobolje i osjećaja slabljenja vida. Objektivno je neurološki utvrđena slabija reaktivnost desne zjenice te diskretna hemipareza lijevo, uz pozitivan Babinskijev refleks. Tijekom kliničkog praćenja zabilježena su razdoblja poboljšanja i pogoršanja neurološkog deficita uz promjenu lokalizacije. Primjerena dijagnostička (neuroradiološka) obrada nije se mogla provesti zbog trudnoće i poglavito zbog odbijanja same trudnice, pa je ona praćena klinički i metodama koje nisu predstavljale rizik za plod. Nakon poroda koji je protekao bez komplikacija provedena je neuroradiološka obrada koja je pokazala ekspanzivnu tvorbu u području hipofize. Bolesnica je liječena operacijski transsfenoidnom selektivnom adenomektomijom. Hormonski nalazi dobiveni prije operacije te histološki i imunohistokemijski nalazi potvrdili su makroprolaktinom hipofize. Tijekom dijagnostike i liječenja postojala je potreba za timskom suradnjom više različitih specijalnosti.

Ključne riječi: *Komplikacije trudnoće – etiologija; Komplikacije trudnoće – dijagnostika; Neoplazme glave i vrata – dijagnostika; Neoplazme hipofize*