



Spina Bifida: Causes, Consequences, and Prevention

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Neural Tube Defects-Types

SPINA BIFIDA

- ❑ Spina Bifida Occulta (hidden): This is the mildest form. 10 % of the population have this defect. It is generally asymptomatic .
- ❑ Meningocele: There is a sac on the back, opening into spinal canal, containing cerebrospinal fluid. There may not be any nerve damage.
- ❑ Meningomyelocele: The sac on the back contains nervous tissue. There is severe nerve damage in this type of anomaly.

ENCEPHALOCELE

- ❑ This is a sac which is formed when the bones of the skull fail to develop. The sac may contain brain tissue, or only cerebrospinal fluid. Brain damage may or may not be seen.

ANENCEPHALY

- ❑ This is where the brain does not develop properly or is absent, and the baby is either stillborn or dies shortly after birth.

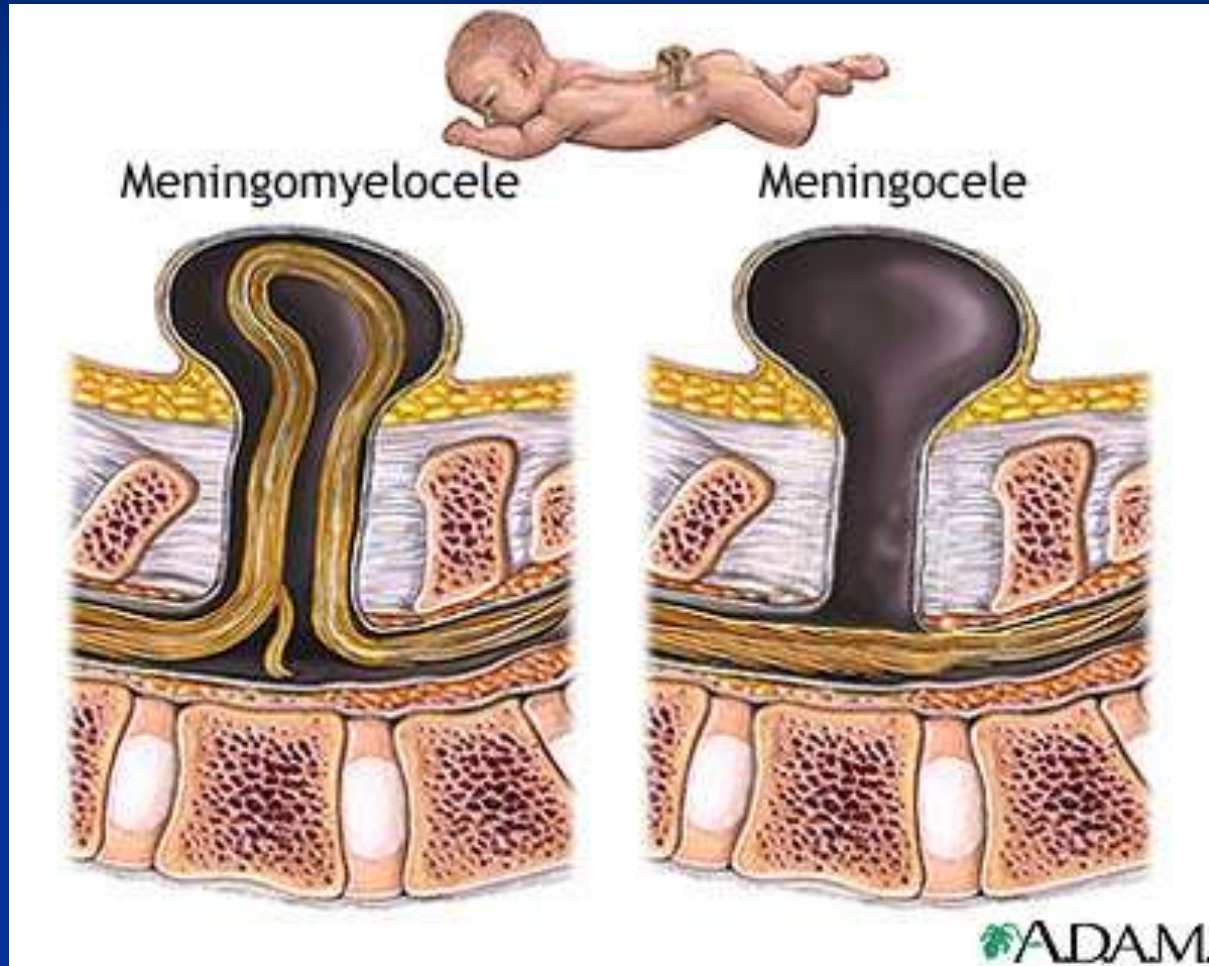
Spina Bifida

- One of the most common congenital defects, occurring within the first 25 days of pregnancy.
- The anomaly has already occurred, as the mother discovers pregnancy.

Spina Bifida

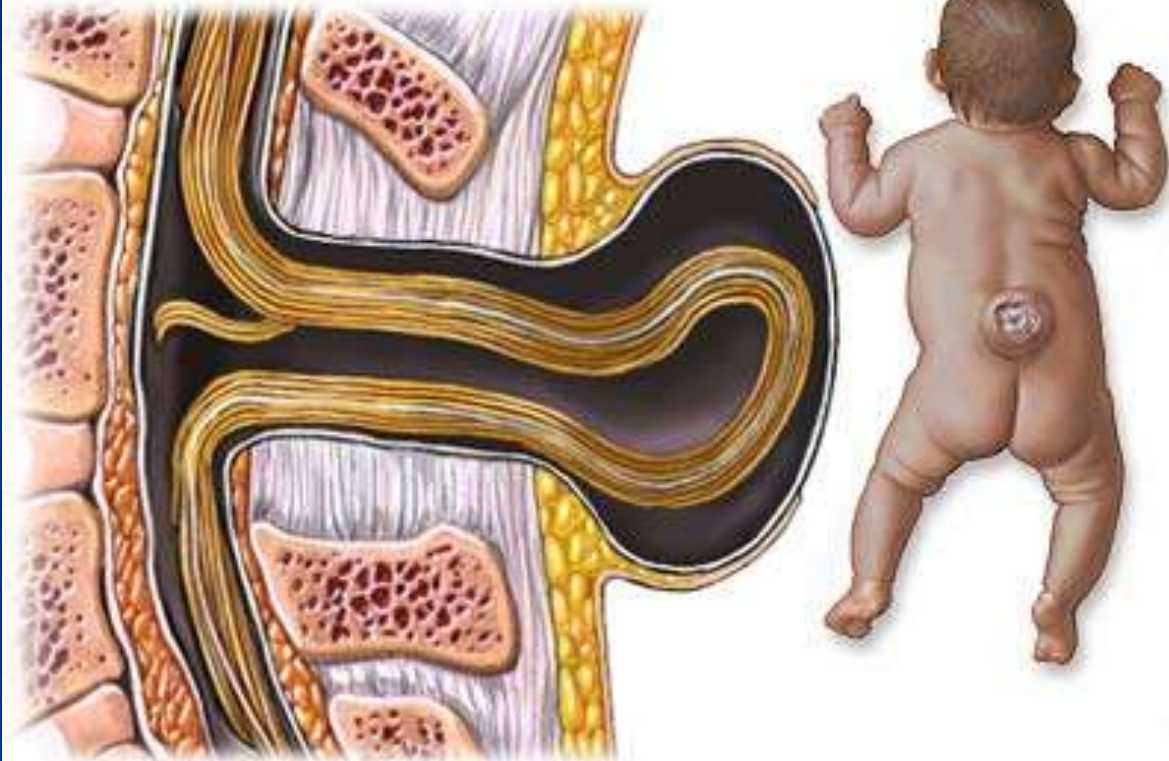
- The central nervous system consists of the brain and the spinal cord.
- The skull and the spine (neural tube), protect the brain and the spinal cord.
- In the embryo, when the neural tube structures cannot develop completely, or close at the back, a gap or a split (bifid) is formed in one or more vertebrae.
- The nervous system is damaged because of this gap.
- Paralysis is seen below the level of damaged spinal cord.

Spina Bifida

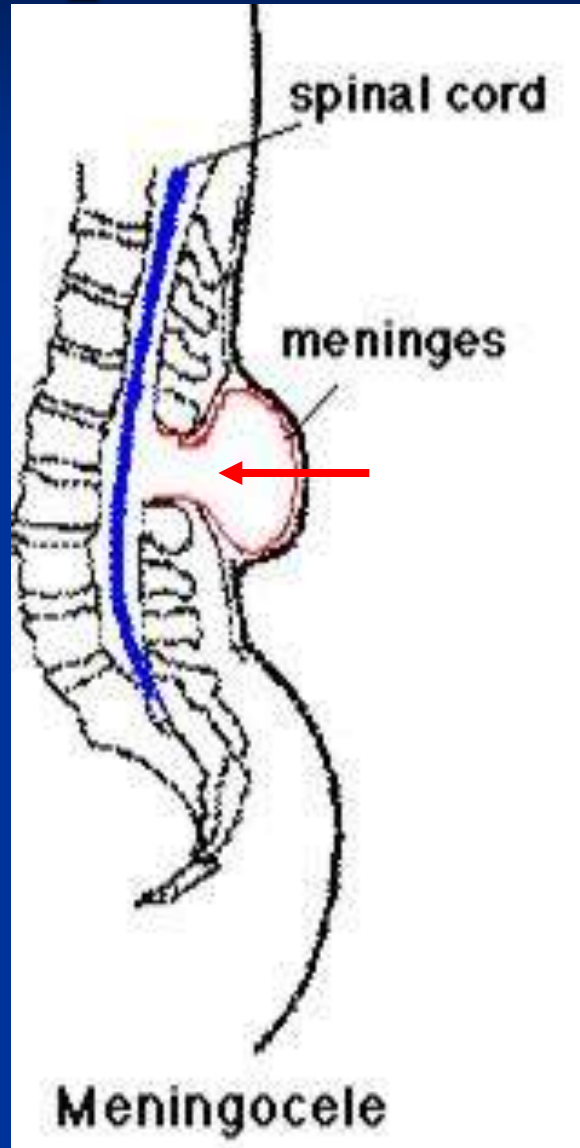


Spina Bifida

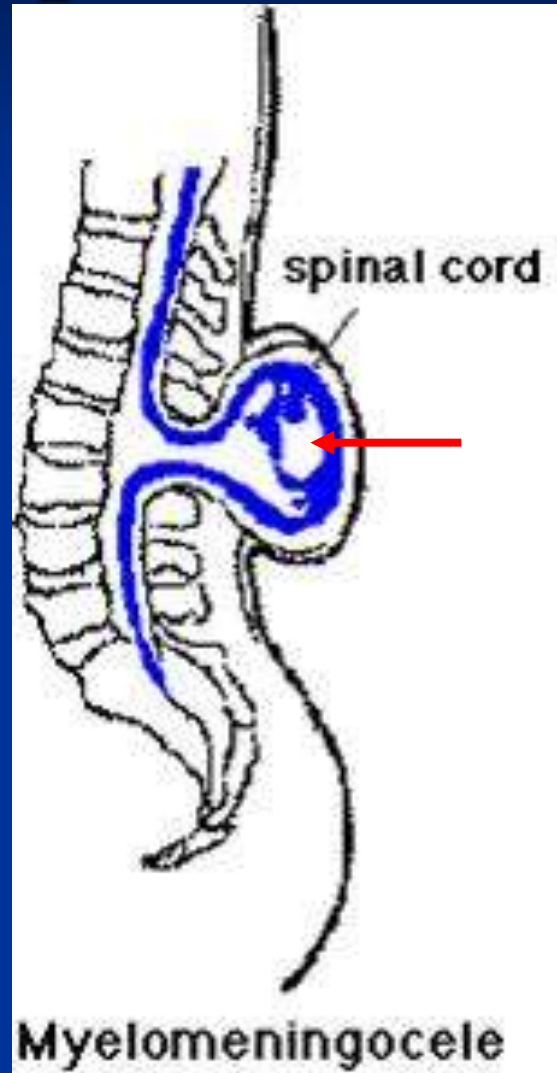
Meningomyelocele



Spina Bifida



Spina Bifida



Spina Bifida - Complications

- There is paralysis below the level of the spinal defect
- Patient may not be able to walk
- urinary and fecal incontinence
- Foot deformities
- Because of the circulatory defect in the cerebrospinal fluid, fluid accumulates in the brain in 85 % of patients (hydrocephalus)
- Psychological problems
- Social problems
- Family problems

Spina Bifida

- There is NO CURE !!!!!
- Many patients survive but many lives are cut short.
- Cognitive brain functions are normal in the majority of patients.
- They need a lifetime support for a better quality of life.
- They may undergo multiple major surgical operations.
- It is a heavy burden for the family and is a dramatic condition.

Spina Bifida Treatments

- Neurosurgery
- Pediatric Surgery and Urology
- Orthopedics
- Physical Rehabilitation
- Pediatric Psychiatry

Neural Tube Defect - Causes

- Genetic or environmental factors.
- Most important preventible factor:

FOLIC ACID INSUFFICIENCY

- Three months prior to, and in the first 3 months of pregnancy, an intake of 400 mcg/day folic acid may reduce the risk of spina bifida and other serious congenital birth defects up to 70 %.

Folic Acid

- Vitamin B9.
- Water soluble, cannot be stored in body, therefore daily intake is necessary.
- Men, women, children... Everyone needs it daily.
- It supports healthy cell production in body.
- Helps gene synthesis in rapidly proliferating cells.

Spina Bifida – Status in Turkey

- Every year approximately 5000 new babies are born with this anomaly.
- The ratio is about 2-3/1000 live births.
- No geographic difference.
- Incidence is higher than the global rates.
- Almost all the patients are supported by government.
- Annual health cost for each patient is about 10,000 USD.
- Lifetime health costs are about 300-500,000 USD.

Spina Bifida – Status in Turkey

- Ministry of Health and Spina Bifida Association promote daily folic acid consumption.
- It is not easy to reach the target population.
- Efforts for arousing public awareness are not always fruitful.
- The effects of campaigns are not sustainable.
- Most of the pregnancies are not planned. It is difficult for the women at reproductive age to gain the habit of regular folic acid consumption.

Spina Bifida – Food for Thought

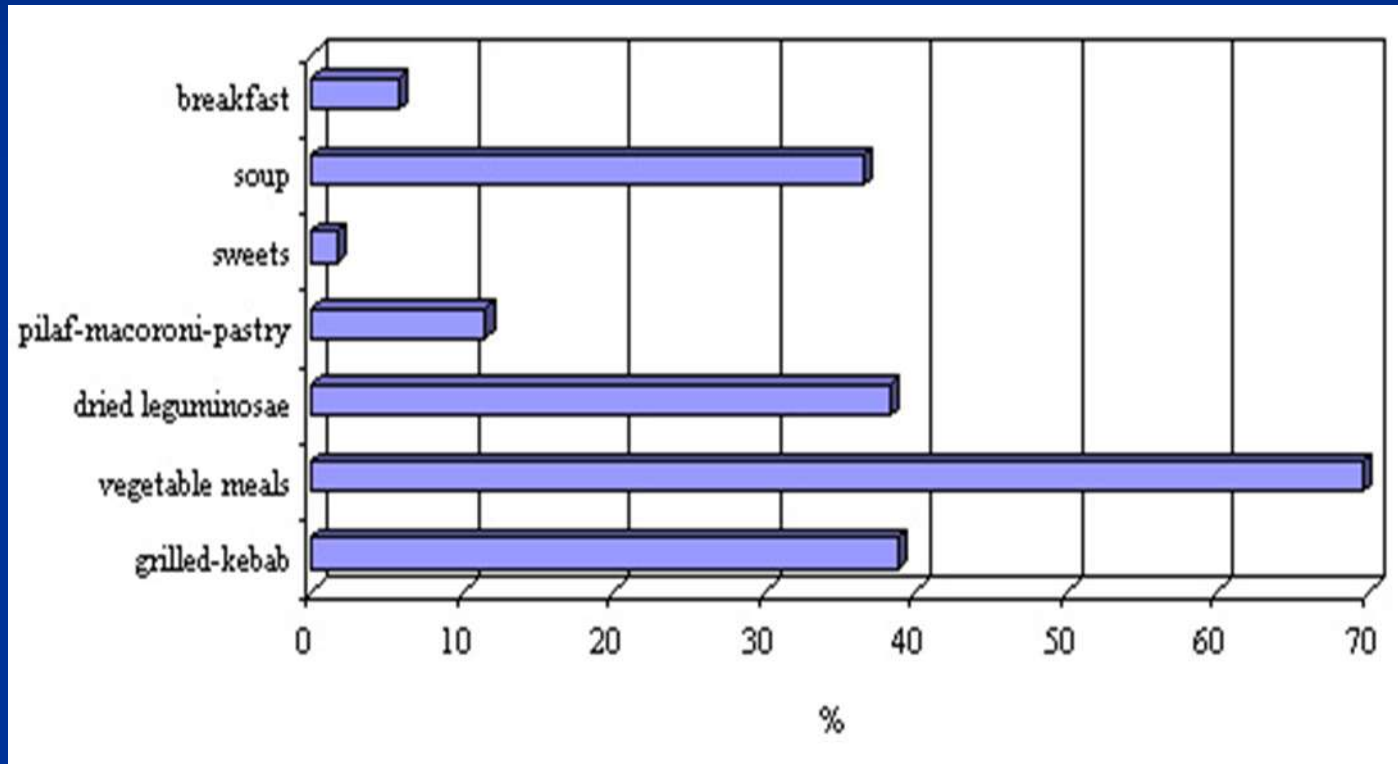
- This anomaly is a heavy burden for the patient, the family, and our country.
- Incidence is very high in Turkey.
- We must immediately promote public folic acid consumption, and the preventive methods applied globally must be adapted for our country.
- We share the responsibility of each baby born with this anomaly !!!!

Recommended Interventions

- Daily supplement of 400 mcg of folic acid for women of reproductive age
 - Supplements work but compliance is poor, issues with availability and cost
- Food Fortification with folic acid
 - No behaviour change involved, high reach, and cost is marginal, impact is high

Bread Consumption in Turkey

Meals which are mostly consumed with bread



Bread Consumption in Turkey

- Daily consumption of Wheat flour : _____
- Total amount of bread produced:
 - traditional : 11.7 million tons
 - packed: 29.000 tons
- Annual bread consumption amount:
 - 150 kgs/year/person (# 1 in the world !!!!)
- Flour used for bread production : _____
- Amount of Folic acid needed for fortification:

Conclusion

- ❑ Bread is a major part of our diet.
- ❑ It is important that we eat healthy bread that is produced, sold and stored under hygienic conditions.
- ❑ When one eats bread made with refined flour then: Fortified Bread is a simple solution.
- ❑ The burden of vitamin and mineral deficiencies in the world is very high, but can be eliminated.
- ❑ Flour fortification is a simple, low cost, and well established method for reducing the health, economic and societal burden of nutrient deficiencies.
- ❑ Fortification improves the nutritional quality of flour.
- ❑ Flour producers and the health sector can become partners in improving health and well-being of people throughout the world.



THANK YOU !!!