Background

This rare metabolic condition has classically been divided into four types:

Neurogenic	Central, hypothalamic, pituitary or neurohypophyseal is caused by a deficiency of the antidiuretic hormone, vasopressin.
Nephrogenic	Vasopressin-resistant is caused by insensitivity of the kidneys to the effect of the antidiuretic hormone, vasopressin
Gestagenic	Gestational is also caused by a deficiency of the antidiuretic hormone, vasopressin, that occurs only during pregnancy.
Dipsogenic	A form of primary polydipsia is caused by abnormal thirst and the excessive intake of water or other liquids.

It classically is characterized by polydipsia (extreme thirst) and polyuria (excessive urination).

OUTLINE

Epidemiology	Neurosurgical patients
Disease Associations	Langerhans cell histiocytosis
Pathogenesis	Central Nephrogenic
Laboratory/Radiologic/Other Diagnostic Testing	Antibodies to vasopressin cells General laboratory workup
Gross Appearance and Clinical Variants	Adipsic Pediatric Psychogenic Sheehan Syndrome
Histopathological Features and Variants	
Prognosis	

Treatment	DDAVP
Commonly Used Terms	
Internet Links	

EPIDEMIOLOGY	**CHARACTERIZATION**
SYNONYMS	Water diabetes
EPIDEMIOLOGIC ASSOCIATIONS	
NEUROSURGICAL PATIENTS	
Diabetes insipidus after pituitary surgery: incidence after traditional versus endoscopic transsphenoidal approaches. **Shah S, Har-El G.** **Department of Otolaryngology, State University of New York, Health Science Center at Brooklyn, USA.**	Am J Rhinol 2001 Nov-Dec;15(6):377-9 Abstract quote The endoscopic transnasal approach is gaining increasing popularity as the surgical method of choice for treatment of pituitary lesions. Previous studies have shown advantages such as quicker recovery and fewer cosmetic, dental, and nasal complications. However, no study has compared the rate of diabetes insipidus (DI) between the traditional and endoscopic approaches. This study will examine the incidence of short- and long-term postoperative DI after transnasal pituitary surgery and compare it with the incidence after traditional transseptal surgery. Eighty-one patients underwent transnasal surgery for the management of pituitary lesions. Fifty-five had the traditional sublabial, transseptal, transsphenoidal surgery and 26 patients had the direct transnasal, transsphenoidal endoscopic procedure. The incidence of immediate postoperative DI was 36% in the traditional group and 15% in the endoscopic group. Short-term (>2 weeks) DI that required treatment occurred in 11 patients (20%) in the traditional group and 2 patients (7.6%) in the endoscopic group. Long-term (>6 months) incidence of DI was 7.2% in the traditional group and 3.8% in the

	endoscopic group. We found a decreased incidence of immediate DI after transnasal endoscopic pituitary surgery as compared with the traditional sublabial transseptal approach. However, the incidence of long-term DI was not significantly different in the two groups.
Diabetes insipidus in neurosurgical patients. **Wong MF, Chin NM, Lew TW.** **Department of Anaesthesiology, Tan Tock Seng Hospital, Singapore.**	Ann Acad Med Singapore 1998 May;27(3):340-3 Abstract quote Diabetes insipidus (DI) is an uncommon but important complication in the neurosurgical population. This retrospective study aimed to determine the incidence, profile and outcome of patients admitted to an 18-bedded neurosurgical intensive care unit who developed DI. The overall incidence was 3.7% (29/792 admissions). Aetiologies included subarachnoid haemorrhage (12/29), severe head injury (11/29), post-surgical excision of craniopharyngioma or pituitary adenoma (5/29) and acute haemorrhagic stroke (1/29). All patients were treated with a regime of fluid replacement, electrolyte correction, parenteral or intranasal desmopressin (DDAVP), or parenteral pitressin. Overall mortality was 72.4%. There were no deaths in the patients who underwent excision of tumours. Complications included acute pulmonary oedema, hypernatremia and hypokalaemia. The development of DI was found to be associated with impending brain death and mortality in the majority of patients with subarachnoid haemorrhage and severe head injury. However, careful diagnosis and management of DI after hypothalamo-neurohypophyseal surgery did not result in any permanent neurological sequelae.

DISEASE ASSOCIATIONS	CHARACTERIZATION
LANGERHANS CELL HISTIOCYTOSIS	
	Med Pediatr Oncol 1995 Apr;24(4):248-56 Abstract quote Diabetes insipidus (DI) in Langerhans cell histiocytosis (LCH) is a common complication of unclear etiology. The incidence varies among different publications from 15% to 50%. In the prospective DAL-HX 83 study, 19 out of 199 patients (9.5%) registered with newly diagnosed LCH were diagnosed to have DI. All patients were stratified according to uniform criteria.
Diabetes insipidus in Langerhans cell histiocytosis: results from the DAL-HX 83 study. **Grois N, Flucher-Wolfram B, Heitger A, Mostbeck GH, Hofmann J, Gadner H.** **St. Anna Children's Hospital, Vienna, Austria.**	One hundred and six patients with disseminated disease were treated with standardized polychemotherapy promptly after diagnosis. At the time of diagnosis of LCH, DI was already established in 8 out of 199 patients (4%). After diagnosis, DI occurred in only one out of the remaining 91 patients with localized disease (1%) and in 10 out of 100 remaining patients with disseminated disease (10%). In 8 patients, the onset of DI was associated with other signs of active LCH. The cumulative risk to develop DI after a median observation time of 5 years 3 months was 11%. Retrospective analysis of clinical features revealed multisystem involvement, skull and orbital lesions, and in particular intracranial extension from osseous lesions to constitute risk factors for DI. Magnetic resonance imaging studies (MRI) were available in 12 patients and showed abnormalities of the pituitary region in 10 children. In none of the patients with established DI was it

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	reversed or ameliorated by any treatment. However, the rapid institution of systemic chemotherapy for disseminated disease seems to prevent the occurrence of DI and may be responsible for the low frequency of DI in the DAL-HX83 study.

PATHOGENESIS	CHARACTERIZATION
CENTRAL	
A new mutation of the arginine vasopressin-neurophysin II gene in a family with autosomal dominant neurohypophyseal diabetes insipidus. **Mundschenk J, Rittig S, Siggaard C, Hensen J, Lehnert H.** **Department of Endocrinology and Metabolism, University of Magdeburg, Germany.**	Exp Clin Endocrinol Diabetes 2001;109(8):406-9 Abstract quote Familial neurohypophyseal diabetes insipidus (FNDI) is an autosomally dominant inherited disorder with a typical onset at one to six years of age. The genetic locus of FNDI is the arginine vasopressin-neurophysin II (AVP-NPII) gene. The gene encoding the precursor hormone (prepro-AVP-neurophysin II) is located in the chromosomal region 20p13 and contains three exons. Mutations that cause FNDI have been found to occur within the signal peptide of the prepro-AVP-neurophysin II precursor, within the coding sequence for neurophysin II and the vasopressin-coding sequence. A family (four members with FNDI, two without FNDI) in three consecutive generations was investigated. Index case was a now 22-year old man with a history of severe polyuria (18 L/day) and polydipsia first recognized at about 4-5 months of age. The arginine vasopressin-neurophysin II gene was investigated by direct sequencing of PCR products amplified from each exon. Subsequently, a restriction analysis was performed to verify the sequencing results. The affected individuals were found to have a missense mutation in exon 2 at

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	nucleotide position 1887 (G to C) of the AVP-NPII gene. Using both restriction enzyme digestion and sequence analysis, the mutation was found in all affected family members, but not in the unaffected members studied. This mutation (1887 G to C) represents a novel mutation of the AVP-NPII gene.
Familial neurohypophysial diabetes insipidus in a large Dutch kindred: effect of the onset of diabetes on growth in children and cell biological defects of the mutant vasopressin prohormone. **Nijenhuis M, van den Akker EL, Zalm R, Franken AA, Abbes AP, Engel H, de Wied D, Burbach JP.** **Isala Klinieken Zwolle, Departments of Pediatrics, 8025 AB Zwolle, The Netherlands.**	J Clin Endocrinol Metab 2001 Jul;86(7):3410-20 Abstract quote Familial neurohypophysial diabetes insipidus (FNDI) is an autosomal dominant trait in which expression of a mutant vasopressin prohormone reduces vasopressin production. We investigated the NP85 Cys-->Gly mutant vasopressin prohormone in a large kindred in The Netherlands. We demonstrate that growth retardation is an important early sign in two children from this kindred, which recuperates by substitution therapy with 1-desamino-8-D-arginine vasopressin. To obtain clues about the basis for the dominant inheritance of FNDI, we analyzed the trafficking and processing of the mutant vasopressin prohormone in cell lines by metabolic labeling and immunoprecipitation. The mutant vasopressin prohormone was retained in the endoplasmic reticulum and thus was not processed to vasopressin. This defect was not caused by dimerization of the vasopressin prohormone via its unpaired cysteine residue. High level expression of the mutant vasopressin prohormone in cell lines resulted in strong accumulation in the endoplasmic reticulum and an altered morphology of this organelle. We hypothesize that disturbance of the endoplasmic reticulum results in dysfunction and ultimately cell death of the cells expressing the mutant prohormone. Our data support the

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	hypothesis that FNDI is a progressive neurodegenerative disease with delayed onset of symptoms. Its treatment requires early detection of symptoms for which growth parameters are useful.
NEPHROGENIC	
Cell-biologic and functional analyses of five new Aquaporin-2 missense mutations that cause recessive nephrogenic diabetes insipidus. **Marr N, Bichet DG, Hoefs S, Savelkoul PJ, Konings IB, De Mattia F, Graat MP, Arthus MF, Lonergan M, Fujiwara TM, Knoers NV, Landau D, Balfe WJ, Oksche A, Rosenthal W, Muller D, Van Os CH, Deen PM.** **Department of Cell Physiology, UMC St. Radboud, Nijmegen, The Netherlands.**	J Am Soc Nephrol 2002 Sep;13(9):2267-77 Abstract quote Mutations in the Aquaporin-2 gene, which encodes a renal water channel, have been shown to cause autosomal nephrogenic diabetes insipidus (NDI), a disease in which the kidney is unable to concentrate urine in response to vasopressin. Most AQP2 missense mutants in recessive NDI are retained in the endoplasmic reticulum (ER), but AQP2-T125M and AQP2-G175R were reported to be nonfunctional channels unimpaired in their routing to the plasma membrane. In five families, seven novel AQP2 gene mutations were identified and their cell-biologic basis for causing recessive NDI was analyzed. The patients in four families were homozygous for mutations, encoding AQP2-L28P, AQP2-A47V, AQP2-V71M, or AQP2-P185A. Expression in oocytes revealed that all these mutants, and also AQP2-T125M and AQP2-G175R, conferred a reduced water permeability compared with wt-AQP2, which was due to ER retardation. The patient in the fifth family had a G>A nucleotide substitution in the splice donor site of one allele that results in an out-of-frame protein. The other allele has a nucleotide deletion (c652delC) and a missense mutation (V194I). The routing and function of AQP2-V194I in oocytes was not different from wt-AQP2; it was therefore concluded that c652delC, which leads to an out-of-frame protein, is the NDI-causing mutation of the second allele. This study indicates that misfolding and ER retention is the main, and possibly

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	only, cell-biologic basis for recessive NDI caused by missense AQP2 proteins. In addition, the reduced single channel water permeability of AQP2-A47V (40%) and AQP2-T125M (25%) might become of therapeutic value when chemical chaperones can be found that restore their routing to the plasma membrane.
Identification of mutations in the arginine vasopressin receptor 2 gene causing nephrogenic diabetes insipidus in Chinese patients. **Chen CH, Chen WY, Liu HL, Liu TT, Tsou AP, Lin CY, Chao T, Qi Y, Hsiao KJ.** **Department of Psychiatry, Tzu-Chi General Hospital and Tzu-Chi University, Hualien City, Taiwan.**	J Hum Genet 2002;47(2):66-73 Abstract quote Congenital nephrogenic diabetes insipidus (NDI) is, in most instances, a rare X-linked recessive renal disorder (MIM 304800) characterized by the clinical symptoms of polyuria, polydipsia, and dehydration. The X-linked NDI is associated with mutations of the arginine vasopressin receptor type 2 (AVPR2) gene, which results in resistance to the antidiuretic action of arginine vasopressin (AVP) in the renal tubules and collecting ducts. Identification of mutations in the AVPR2 gene can facilitate early diagnosis of NDI, which can prevent serious complications such as growth retardation and mental retardation. We analyzed three unrelated Chinese NDI families and identified three mutations: R106C, F287L, and R337X. In addition, an A/G polymorphism at cDNA nucleotide position 927 (codon 309L) was identified. A functional expression assay of the R106C and F287L mutants in COS-7 cells revealed that both mutants show significant dysfunction and accumulate intracellular cyclic adenosine monophosphate in response to AVP hormone stimulation. These results facilitate the diagnosis of NDI at the molecular level in the Chinese population, and provide insight into the molecular pathology of NDI.

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LABORATORY/RADIOLOGIC/ OTHER TESTS	CHARACTERIZATION
RADIOLOGIC	
MR imaging of central diabetes insipidus: a pictorial essay. **Shin JH, Lee HK, Choi CG, Suh DC, Kim CJ, Hong SK, Na DG.** **Department of Radiology, Asan Medical Center, University of Ulsan College of Medicine, Seoul, Korea**	Korean J Radiol 2001 Oct-Dec;2(4):222-30 Abstract quote Central diabetes insipidus (DI) can be the outcome of a number of diseases that affect the hypothalamic-neurohypophyseal axis. The causes of the condition can be classified as traumatic, inflammatory, or neoplastic. Traumatic causes include postoperative sella or transection of the pituitary stalk, while infectious or inflammatory causes include meningitis, lymphocytic hypophysitis, and granulomatous inflammations such as sarcoidosis and Wegener's granulomatosis. Various neoplastic conditions such as germinoma, Langerhans cell histiocytosis, metastasis, leukemic infiltration, lymphoma, teratoma, pituitary adenoma, craniopharyngioma, Rathke cleft cyst, hypothalamic glioma, and meningioma are also causes of central DI. In affected patients, careful analysis of these MR imaging features and correlation with the clinical manifestations can allow a more specific diagnosis, which is essential for treatment.

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LABORATORY MARKERS	
ANTIBODIES TO VASOPRESSIN CELLS	
Longitudinal study of vasopressin-cell antibodies and of hypothalamic-pituitary region on magnetic resonance imaging in patients with autoimmune and idiopathic complete central diabetes insipidus. **De Bellis A, Colao A, Bizzarro A, Di Salle F, Coronella C, Solimeno S, Vetrano A, Pivonello R, Pisano G, Lombardi G, Bellastella A.** **Department of Clinical and Experimental Medicine and Surgery F. Magrassi, Second University of Naples, Italy**	J Clin Endocrinol Metab 2002 Aug;87(8):3825-9 Abstract quote Diagnosis of autoimmune central diabetes insipidus (CDI) is based on the presence of autoantibodies to AVP-secreting cells (AVPcAb) or the coexistence of other autoimmune polyendocrine syndromes; moreover, it can be also suggested by the presence of lymphocytic infundibulo-neurohypophysitis, evidenced by biopsy of pituitary stalk and/or by pituitary stalk thickening on magnetic resonance imaging (MRI). However, so far, in clinical CDI patients with lymphocytic infundibulo-neurohypophysitis, AVPcAb have not been investigated and in those with or without autoimmune polyendocrine syndromes (APS), longitudinal studies on the behavior of AVPcAb alone, or of both AVPcAb and hypothalamic pituitary imaging on MRI are lacking. Aim of this work was to investigate in these patients the occurrence of AVPcAb (by indirect immunofluorescence) and of pituitary stalk thickening (by MRI) and their longitudinal changes

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	during a follow-up period. We studied 22 patients, aged 29-53, with APS and complete CDI, grouped as follows: 10 with recent onset (< or =1.5 yr) of CDI (group 1a) and 12 with CDI of long-term duration (> or = 7 yr) (group 1b); moreover, a group of 13 patients with apparent idiopathic CDI of recent onset (<1.5 yr) were studied. They were divided, on the basis of the detection of AVPcAb as follows: 5 AVPcAb positive patients (aged 19-26) classified as isolated autoimmune CDI (group 2) and 8 AVPcAb negative patients (aged 21-26), classified as true idiopathic CDI (group 3). All patients were evaluated yearly, along 5 yr, for AVPcAb and for hypothalamic-pituitary region imaging. At study entry, 8/10 (80%) of patients in group 1a and 7/12 (58.3%) in group 1b were positive for AVPcAb and persisted positive subsequently, during all the follow-up period, even if at lower titers. All patients in group 2 were positive and all those in group 3 were negative for AVPcAb and persisted positive and negative, respectively, for all the follow-up study. Among the AVPcAb-positive patients, only 5 in group 1a and 2 in group 2 showed also pituitary stalk thickening at the first observations, which

	however spontaneously disappeared subsequently indicating a possible lymphocytic infundibulo-neurohypophysitis. All patients in the studied groups showed loss of the hyperintense signal of the neurohypophysis on MRI at entry and during all the follow-up period. Results of this longitudinal study suggest: 1) AVPcAb, frequently present at high titers in recent phases of CDI, persist subsequently, even if at lower titers, several years after the onset of disease. 2) The occurrence of a lymphocytic infundibulo-neurohypophysitis suggested by the pituitary stalk thickening on MRI only in patients positive for AVPcAb confirms a further autoimmune variant of CDI also in these cases. 3) The longitudinal behavior of patients in group 3 suggests that the absence of AVPcAb at the onset of clinical idiopathic CDI is able to exclude a subsequent appearance of these antibodies and consequently an autoimmune involvement in CDI of these patients. Instead the finding of AVPcAb in several patients with only CDI, thought at first clinical observation as idiopathic, indicates that the prevalence of autoimmune CDI must be considered much higher than that so

	far reported.
GENERAL TESTING AND SCREENING	
URINE VOLUME	24-hour urine Total volume of more than 3 quarts (40 ml/kg body weight per day or higher in adults and older children) with an osmolality below 300 mOsm/kg H20 (specific gravity <1.010) warrants further evaluation for DI. In infants or young children: Fluid intake; an intake of approximately 1 1/2 to 2 quarts per day (100 ml/kg body weight per day or more) will be strongly suggestive of DI.
SERUM SODIUM	Measure plasma sodium concentration during ad libitum fluid and food intake. If plasma sodium is above normal while urine osmolality is below 300 mOsm/kg H20, then check the urine osmolality with dDAVP test
URINE OSMOLALITY AND dDAVP CHALLENGE	Injection of desamino, d-arginine vasopressin (dDAVP) -- 1 to 3 micrograms subcutaneously and measure urine osmolality 1 to 2 hours later If the urine osmolality rises by 50% or more (e.g., from 280 mOsm/kg H20 before dDAVP to 420 mOsm/kg H20 or higher after dDAVP), then a diagnosis of neurogenic DI (pituitary

	or central DI) is likely If the urine osmolality rises by less than 50%, then nephrogenic DI may be present

GROSS APPEARANCE/ CLINICAL VARIANTS	CHARACTERIZATION
GENERAL	
VARIANTS	
ADIPSIC	
Baroregulation of vasopressin release in adipsic diabetes insipidus. **Smith D, McKenna K, Moore K, Tormey W, Finucane J, Phillips J, Baylis P, Thompson CJ.** **Department of Endocrinology, Beaumont Hospital, Dublin 9, Republic of Ireland.**	J Clin Endocrinol Metab 2002 Oct;87(10):4564-8 Abstract quote Adipsic diabetes insipidus (ADI) occurs in association with a heterogeneous group of conditions. We report vasopressin (AVP) responses to hypotension in nine patients with ADI and nine controls. Hypertonic saline infusion produced absent thirst (1.7 +/- 1.7 to 1.5 +/- 1.7 cm, P = 0.99) and AVP responses (0.3 +/- 0.1 to 0.4 +/- 0.1 pmol/liter, P = 0.99) in the ADI group, who also drank less than the control group (258 +/- 200 ml vs. 1544 +/- 306 ml, P < 0.001). Intravenous infusion of trimetaphan camsylate produced a fall in mean arterial pressure of 31.6% +/- 8.9% in patients and 29.4% +/- 6.1% in controls. Plasma AVP concentrations rose from 1.4 +/- 0.8 to 340.3 +/- 497.4 pmol/liter (P < 0.001) in the control group. In three patients with craniopharyngioma, there was no rise in plasma AVP concentrations (0.3 +/- 0.1 to 0.3 +/- 0.1 pmol/liter, P = 0.96), but plasma AVP rose significantly in response to hypotension in the other six patients (0.4 +/- 0.2 to 204.5 +/- 223.2

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	pmol/liter, P < 0.001). We concluded that the AVP responses to hypotension in ADI are heterogeneous and reflect the site of the lesion causing the diabetes insipidus.
PEDIATRIC	
Diabetes insipidus in children: pathophysiology, diagnosis and management. **Cheetham T, Baylis PH.** **Department of Child Health, Royal Victoria Infirmary, Newcastle Upon Tyne, UK.**	Paediatr Drugs 2002;4(12):785-96 Abstract quote In diabetes insipidus, the amount of water ingested and the quantity and concentration of urine produced needs to be carefully regulated if fluid volume and osmolality are to be maintained within the normal range. One of the principal mechanisms controlling urine output is vasopressin which is released from the posterior pituitary gland and enhances water reabsorption from the renal collecting duct. In diabetes insipidus, the excessive production of dilute urine, and the causes of this clinical picture can be divided into three main groups: the first is primary polydipsia where the amount of fluid ingested is inappropriately large; the second group is cranial diabetes insipidus where the production of vasopressin is abnormally low; and, the third group is nephrogenic diabetes insipidus where the kidney response to vasopressin is impaired. The history and examination may suggest an underlying explanation for diabetes insipidus but a range of baseline and more extensive investigations may be required before a diagnosis can be reached. These investigations are not without risk, and the results need to be interpreted carefully because children do not always segregate neatly into a particular diagnostic category on the basis of one test alone. Children with cranial diabetes insipidus typically respond to arginine vasopressin

	or its manufactured analogue, desmopressin, with an increase in urine osmolality and an associated reduction in urine output. Such children usually require neuroimaging to look for evidence of evolving CNS pathology, such as an intracranial tumour. Vasopressin 'replacement' with desmopressin is the treatment of choice in patients with cranial diabetes insipidus although extreme caution is required when treating babies or small children because of the danger of fluid overload. Abnormal production of other pituitary hormones in children with CNS disease can also influence fluid balance. Nephrogenic diabetes insipidus can be due to abnormal electrolyte concentrations, therefore these should be measured as part of the initial assessment. In a small number of children the defect is a primary abnormality of the vasopressin receptor or one of the water channel proteins (aquaporins) involved in water transport. The treatment of these patients is difficult and typically involves therapy with a diuretic such as chlorothiazide, as well as indomethacin. These agents enhance urine osmolality by their effect on circulating volume and renal solute and water handling. The fluid intake of most young children with primary polydipsia can be safely reduced to a more appropriate level.
Etiologies of central diabetes insipidus in children : 15 years experience in Songklanagarind hospital, Thailand. **Jaruratanasirikul S, Janjindamai S, Sriplung H, Patarakijvanich N,**	J Med Assoc Thai 2002 Jul;85(7):765-71 Abstract quote Central diabetes insipidus (DI) is a rare disease in children. The authors retrospectively reviewed the records of children with central DI identified at Songklanagarind Hospital from 1985 to 2000. Of the total 29 patients identified, 16 patients were males and 13 were females.

Vasiknanonte P. **Department of Pediatrics, Faculty of Medicine, Prince of Songkla University, Thailand.**	All patients received computed tomography or magnetic resonance imaging of the brain to differentiate the etiologies of central DI. The median age at diagnosis was 6.6 years (range 1.5-14.9). The etiologies of central DI were intracranial tumors in 7 patients (24.1%), histiocytosis in 3 patients (10.3%), septooptic dysplasia in 1 patient (3.5%), empty-sella syndrome in 1 patient (3.5%), pituitary abscess in 1 patient (3.5%), and idiopathic in 16 patients (55.1%). All patients with idiopathic central DI were followed-up for a median duration of 4.5 years (range 1.3-15.5). Three of 16 patients (18.8%) were found to have intracranial tumors at 1.3, 2.3, and 3.5 years of follow-up. It was also observed that the patients whose age at presentation was less than 5 years (histiocytosis was excluded) were less likely to have intracranial tumors than those older than 5 years, (0% vs 55%), with significant statistical difference ($p<0.01$). It is concluded that: 1) the common etiologies of central DI are intracranial tumor and idiopathic, 2) patients initially diagnosed with idiopathic central DI need to have long-term follow-up by magnetic resonance imaging to identify any occult intracerebral tumor.
PSYCHOGENIC	
Psychogenic diabetes insipidus in toddlers with compulsive bottle-drinking: not a rare entity. **Cemeroglu AP, Buyukgebiz A.** **Department of Pediatric Endocrinology and Adolescence,**	J Pediatr Endocrinol Metab 2002 Jan;15(1):93-4 Abstract quote Psychogenic diabetes insipidus is commonly seen in adolescents but very rarely reported in toddlers. We report three toddlers who presented to our clinic with compulsive drinking behavior and polyuria. Laboratory work-up and water deprivation tests were consistent with psychogenic diabetes insipidus.

Faculty of Medicine, Dokuz Eylul University, Izmir, Turkey.	
SHEEHAN SYNDROME	
Sodium and water disturbances in patients with Sheehan's syndrome. **Pham PC, Pham PA, Pham PT.** **Nephrology Division, Department of Medicine, Olive View-UCLA Medical Center, Sylmar, CA 91342, USA.**	Am J Kidney Dis 2001 Sep;38(3):E14 Abstract quote Sheehan's syndrome has been attributed to ischemic damage of the pituitary gland or hypothalamic-pituitary stalk during the peripartum period. Well-described clinical features of Sheehan's syndrome include hypothyroidism, adrenal insufficiency, hypogonadism, growth hormone deficiency, hypoprolactinemia, and different sodium and water disturbances. The occurrence of sodium and water disturbances associated with Sheehan's syndrome depends on the degree of pituitary damage, time of onset since the initial pituitary insult, and concurrent medical conditions that also may play a role in sodium and water balance. We present a patient with Sheehan's syndrome with severe chronic hyponatremia; discuss a potential problem in the patient's management; and review the literature for various sodium and water disturbances, including acute and chronic hyponatremia as well as overt and subclinical central diabetes insipidus. Although Sheehan's syndrome is more prevalent in developing countries, the increasingly large immigrant population within the United States warrants better awareness of this syndrome and its potential complicating sodium and water disturbances. Prompt diagnosis and an understanding of the pathogenic mechanisms of sodium and water disturbances associated with Sheehan's syndrome may avoid potential treatment-related complications.

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HISTOLOGICAL TYPES	CHARACTERIZATION
GENERAL	
Lymphocytic infundibulo-neurohypophysitis with hypothalamic and optic pathway involvement: report of a case and review of the literature. **Ouma JR, Farrell VJ.** **Department of Neurological Surgery, Johannesburg Hospital, and the University of the Witwatersrand, Johannesburg, South Africa.**	Surg Neurol 2002 Jan;57(1):49-53; discussion 53-4 Abstract quote BACKGROUND: Lymphocytic adenohypohysitis and lymphocytic infundibulo-neurohypophysitis are rare auto-immune mediated diseases of the anterior and posterior pituitary, respectively. The former usually manifests as insufficiency of anterior pituitary hormone secretion, associated in many patients with disturbances of vision. The latter presents as diabetes insipidus of central origin.They present most commonly in pregnant or postpartum females. There have been infrequent reports in females with no association with pregnancy, and in males. CASE DESCRIPTION: We present a nulliparous female with central diabetes insipidus, pan-hypopituitarism, and severely impaired vision. Magnetic resonance imaging demonstrated a large mass involving the hypothalamus, infundibulum, optic nerves, chiasm, and tracts. At operation, the optic pathways were found to be grossly involved in the inflammatory mass. Histological examination of a biopsy demonstrated a nonspecific, mixed inflammatory infiltrate, composed predominantly of lymphocytes and plasma cells. She responded dramatically to treatment with dexamethasone, with disappearance of the mass on serial imaging studies and improvement in vision. In addition, she received hormone replacement therapy. CONCLUSION: We present a case of lymphocytic infundibulo-neurohypophysitis unique in the degree of optic pathway inflammatory

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	involvement, with a documented response to steroids.

PROGNOSIS	CHARACTERIZATION
CENTRAL	
Acquired central diabetes insipidus in children: a 12-year Brisbane experience. **Al-Agha AE, Thomsett MJ, Ratcliffe JF, Cotterill AM, Batch JA.** **Department of Endocrinology and Diabetes, Royal Children's Hospital Brisbane, Queensland, Australia.**	J Paediatr Child Health 2001 Apr;37(2):172-5 Abstract quote OBJECTIVE: To study the clinical, endocrine and radiological features and progress of children presenting with acquired diabetes insipidus (CDI). METHODOLOGY: Chart review of children presenting because of CDI to Brisbane paediatric endocrine clinics between 1987 and 1999. RESULTS: Thirty-nine children (female/male ratio 21/18) aged 0.1-15.4 years (mean age 6.7 years) were identified. Aetiologies were head trauma or familial in eight cases (20.5%) each, central nervous system (CNS) tumours in five cases (12.8%), CNS malformations in four cases (10.2%), histiocytosis in three cases (7%) and hypoxia and infection in two cases (5.1%) each. Seven cases (17.9%) remain undiagnosed. Of the 32 (82%) cases with isolated anti-diuretic hormone deficiency at presentation, 24 cases (61.5%) experienced no further endocrine deficit. Additional endocrine deficits occurred mainly in the tumour or undiagnosed groups. On follow-up brain magnetic resonance imaging (MRI) scans in the seven undiagnosed cases, six patients had mild or no change and one patient had marked improvement of MRI findings. These changes occurred 10-48 months (mean 18 months) after presentation. CONCLUSIONS: Children without an

	aetiological diagnosis for the uncommon condition of acquired CDI require careful follow-up. More intensive investigation at presentation (e.g. estimation of cerebrospinal fluid human chorionic gonadotrophin) promises to lessen the number of such cases. Pituitary stalk biopsies should be reserved for those patients with progressive MRI changes. If these changes do not occur early, our experience suggests that follow-up MRI scans may need to be performed only yearly.

TREATMENT	CHARACTERIZATION
GENERAL	
DDAVP	
Morbidity and mortality associated with vasopressin replacement therapy in children. **Rizzo V, Albanese A, Stanhope R.** **Department of Paediatric Endocrinology, Great Ormond Street Hospital for Children, London, UK.**	J Pediatr Endocrinol Metab 2001 Jul-Aug;14(7):861-7 Abstract quote OBJECTIVE: To assess the incidence and associated risk factors of adverse reactions of DDAVP treatment of children with diabetes insipidus, comparing different routes of administration. DESIGN: We retrospectively studied 103 children (44 females, 59 males) with cranial diabetes insipidus (mean age 6.9 years at diagnosis) treated with intramuscular (59), intranasal (84) and/or oral (64) DDAVP, over a mean follow-up period of 5.2 years. RESULTS: Eight patients died. For at least two children death was related to water intoxication. Major complications (symptomatic water overload with or without seizures) or asymptomatic hyponatraemia were observed in 33 patients. The incidence of total complications was significantly higher in cortisol deficient patients than in those with normal cortisol reserve (36% vs

	6%). In patients on concomitant carbamazapine treatment major complications were more frequent in comparison to the remaining patients (33% vs 10%). Although not achieving significance, there were fewer complications using the oral route. CONCLUSIONS: Caution is needed in managing patients with DI, especially if risk factors such as cortisol deficiency or concomitant carbamazepine treatment are present. The oral route of administration seems to be preferred for both convenience and safety. Major changes in dose and formulation should be undertaken in hospital.

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