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DIAGNOSTIC APPROACHES IN TUBERCULOUS MENINGITIS.

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Background: Tuberculosis (TB) is one of the commonest causes of bacterial meningitis in Hong Kong. Bacterial isolation from CSF takes several weeks. Therefore, the initial diagnosis of tuberculous meningitis (TBM) relies on clinical features, CSF examination, and PCR for *Mycobacterium tuberculosis.* **Objective:** To study the clinical features and laboratory findings in patients with TBM and determine the usefulness of various diagnostic approaches. **Method:** Patients presented between January 1996 and June 1997 were studied. TBM was diagnosed by a positive smear or culture of acid-fast bacilli (AFB) in CSF, a positive PCR for *M. tuberculosis* DNA in CSF, or a therapeutic response to anti-TB drugs. The clinical features and laboratory findings on presentation were recorded. Extra-neural TB was screened for. The proportions of patients satisfying the following criteria were determined: 1) Fever and headache lasting for more than 14 days, 2) CSF lymphocytic pleocytosis - cell count $>20\times10^6$/L with $>60\%$ lymphocytes, 3) CSF protein >1.00 g/L and CSF to blood glucose ratio $<60\%$, 4) Presence of extra-neural TB, 5) Positive CSF PCR. **Results:** Over 18 months, twelve patients were confirmed to have TBM. Mean age of presentation was 44 and half were male. CSF was positive for AFB smear, culture, and PCR in none (0%), three (25%), and three (25%) patients, respectively. Mean duration from onset to diagnosis was 10.1 days (range 0 to 21, >14 days in 3 cases). Only two patients (17%) presented with headache and fever for over 14 days. Extra-neural TB was present in five patients (42%). Mean CSF cell count was 259×10^6/L (range 0 to 720). Seven pateints (64%) had lymphocytic pleocytosis. Mean CSF protein level and CSF to blood glucose ratio were 2.49 g/L (range 0.52 to 5.81, ≤1.00 g/L in 17%) and 39% (range 25 to 71, $\geq60\%$ in 9%), respectively. Eight patient (67%) satisfied the biochemical criteria for TBM. The initial diagnosis of TBM was made on positive CSF PCR in two patients in whom the clinical and other laboratory findings were atypical of TBM. **Conclusion:** Presentation of TBM was relatively acute in our studied population. Headache and fever for over 14 days, which was considered mandatory in diagnosing TBM, was uncommon. The initial diagnosis of TBM was made on routine CSF examination in the majority of patients. PCR became helpful when the other CSF parameters were equivocal.

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ECONOMIC IMPACT OF EPILEPSY SURGERY: COST-OF-ILLNESS ANALYSIS USING A COMBINATION DESIGN MODEL.

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Background: Epilepsy is a major source of health care expenditure. Surgery is superior to drug therapy for seizure control in patients with medically refractory epilepsy (MRE). However, the operation and pre-surgical workup are expensive. **Objective:** To perform a cost-of-illness analysis of epilepsy care with a combination design model and determine the potential economic benefits of epilepsy surgery (ES). **Method:** Avoidable costs attributable to epilepsy were estimated from a societal perspective. A retrospective cohort of medically-treated patients followed-up at the Epilepsy clinic from 1992 to 1996 was divided into four prognostic subgroups. Direct costs (resources utilised in delivering medical care) were synthesized from secondary data by micro-costing and modelled data by gross-costing. In estimating the indirect costs (related to the consequences of illness), productivity lost was used as a proxy for opportunity costs. Direct and indirect costs were projected over five and ten years with an annual discount rate of 4%. Univariate sensitivity analyses on the model and parameter uncertainties were performed. Economic saving by ES was calculated by extrapolating outcome probabilities from another cohort of surgically-treated patients. **Results:** 666 records were analysed. During this period, total direct costs of all groups added up to HK$7.6M (41.3%) and indirect costs to $10.8M (58.7%). Regarding the direct costs, 23.8% was spent on medications, 39.0% on outpatient services, and 37.5% on hospitalization. The mean total costs per patients with MRE, intermediate seizure control, early remission, and chronic remission were $10.1K, $6.0K, $3.5K, and $1.8K in 1992, and $20.2K, $12.1K, $6.2K, and $1.8K in 1996, respectively. The projected total costs (adjusted to 1996 value) per patient with MRE, intermediate seizure control, early remission, and chronic remission over five and ten years would be $105.7K and 310.3K, $63.4K and 139.5K, $13.4K and 26.3K, and $10.1K and 22.7K, respectively. Future medical costs saved by ES for each patient with MRE would be $73.1K at five years and $234.9K at ten years. The most significant determinants for economic benefits were surgical outcome in seizure control and future discount rate. **Conclusion:** Indirect costs account for about 60% of the total expenditures in epilepsy care. Patients with MRE utilise substantially more resources than those in remission. ES can greatly reduce future medical costs via improving seizure control in MRE. If the marginal expenditure for each case of ES performed is less than $234.9K, a breakeven can be achieved after ten years. However, this magnitude of economic benefits applies only if surgical outcome is satisfactory.