

STA2453 - In-class assignment

Study Description

A study published in March, 1986 in the British Medical Journal examined the success of three different procedures for removing kidney stones.

The three procedures were:

1. Open surgery
2. Percutaneous nephrolithotomy
3. ESWL

Methods

350 cases of open stone removal, 350 cases of percutaneous nephrolithotomy, and 352 cases of ESWL. All patients were treated by the same team of surgeons under the direct supervision of one consultant. (Carig et al.)

Data

TABLE I—Details of patients in each treatment group

	No (%) of patients with stones		Total	Mean age (range)	M:F (%)
	<2 cm (group 1)	≥2 cm (group 2)			
Nephrolithotomy/pyelolithotomy	13 (6)	218 (94)	231	45 (12-78)	45:55
Pyelolithotomy	31 (41)	45 (59)	76	47 (16-72)	51:49
Ureterolithotomy	43 (100)		43	46 (20-68)	69:31
Percutaneous nephrolithotomy	270 (77)	80 (23)	350	52 (23-72)	68:32
ESWL	204 (62)	124 (38)	328	48 (22-83)	70:30
Percutaneous nephrolithotomy and ESWL		24 (100)	24		

- group 1: patients with a stone < 2cm; and group 2 patients with a stone ≥ 2cm.

Data

TABLE II—Success rate of treatment* (figures are numbers (%) of patients)

	Group 1	Group 2	Overall
Nephrolithotomy/pyelolithotomy	12 (92)	154 (71)	166 (72)
Pyelolithotomy	26 (84)	38 (84)	64 (84)
Ureterolithotomy	43 (100)		43 (100)
All open procedures	81 (93)	192 (73)	273 (78)
Percutaneous nephrolithotomy†	234 (87)	55 (69)	289 (83)
ESWL	200 (98)	101 (82)	301 (92)
Percutaneous nephrolithotomy and ESWL		15 (62)	15 (62)

*Success defined as no stones at three months or stone reduced to particles <2 mm in size.

†52 with electrohydraulic lithotripsy, 69 with ultrasound.

Assignment

1. Use Python or R (<https://utoronto.syzygy.ca> (<https://utoronto.syzygy.ca>)) to create this study's data set. It should contain information on patients that received open stone removal and percutaneous removal. In particular the data set should contain the type of procedure, the outcome of the procedure, and the size of the kidney stone.

2. Use the data to compare the success rates of open procedures versus percutaneous nephrolithotomy. Which procedure is more effective? Explain your reasoning.