

The effect of medical clowns on performance of spirometry among preschool aged children

Vered Nir MD, Vered Schichter-Konfino
MD, Eias Kassem MD, Adi Klein MD
Department of Pediatrics, Hillel Yaffe
Medical Center

Introduction

- The presence of medical clowns during medical procedures reduce pain perception and anxiety levels:
 - Reduce pain during venipuncture in pediatric emergency department
 - Reduced preoperative anxiety and postoperative pain
 - Facilitated nitrous oxide sedation during intra-articular corticosteroid injections
 - Alleviated anxiety and pain in children undergoing allergy prick skin test

- Meiri N, Ankri A, Hamad-Saied M, Konopnicki M, Pillar G. The effect of medical clowning on reducing pain, crying, and anxiety in children aged 2-10 years old undergoing venous blood drawing--a randomized controlled study. *Eur J Pediatr*. 2016;175(3):373.-379
- Wolyniez I, Rimón A, Scolnik D, Gruber A, Tavor O, Haviv E, et al. The effect of a medical clown on pain during intravenous access in the pediatric emergency department: a randomized prospective pilot study. *Clin Pediatr (Phila)*. 2013;52(12):1168.-1172
- Vagnoli L, Caprilli S, Robiglio A, Messeri A. Clown doctors as a treatment for preoperative anxiety in children: a randomized, prospective study. *Pediatrics*. 2005;116(4):e563-567.
- Golan G, Tighe P, Dobija N, Perel A, Keidan I. Clowns for the prevention of preoperative anxiety in children: a randomized controlled trial. *Paediatr Anaesth*. 2009;19(3):262-266.
- Weintraub Y, Rabinowicz N, Hanuka P, Rothschild M, Kotzki S, Uziel Y. Medical clowns facilitate nitrous oxide sedation during intra-articular corticosteroid injection for juvenile idiopathic arthritis. *Isr Med Assoc J*. 2014;16(12):771-773.
- Goldberg A, Stauber T, Peleg O, Hanuka P, Eshayek L, Confino-Cohen R. Medical clowns ease anxiety and pain perceived by children undergoing allergy prick skin tests. *Allergy*. 2014;69(10):1372-1379.

Introduction

- Fresh from the oven:
- Assistance of Medical Clowns Improves the Physical Examinations of Children Aged 2-6 Years
- Children admitted in surgical department with MCs had lower anxiety ratings and a higher oxytocin concentration
- Clown-care alleviated pain sensation during Botulinum-toxin injections and initial clown-care experience reduced pain during subsequent injections even though clowns were not present

Introduction

- Currently there is no standard method for evaluating pulmonary function in preschool children younger than 6 years of age
- Spirometry is the most accessible method for evaluating pulmonary function:
 - Simple
 - Noninvasive
 - Allows an informative result within a few minutes

Introduction

- However, it may be challenging to achieve an acceptable result in young children:
 - Time consuming
 - Requires the patient to be cooperative
- A young child may be intimidated by the need to place a medical object in his mouth
- Attention span may not allow cooperation
- May not be willing to repeat the maneuver if asked to do so

Introduction

- 95% of children aged 8 to 9 years were able to yield adequate spirometry results
- Success rates among preschoolers ranged from 50% to 85%



Dream Doctors

- The Dream Doctors Project was born in 2002
- Improve the wellbeing of child patients and their families
- Assist the medical care staff in making procedures less anxiety-ridden
- Currently working in partnership with 29 hospitals in Israel
- Each year, approximately 200,000 children and adult patients encounter a Dream Doctor

Dream Doctors

- The MCs are professional trained theatre actors
- They receive a basic course in medical clowning that lasts five months
- They receive two years tutoring by an experienced clown
- Undergo continual educational courses in specific areas

Dream Doctors

- In Hillel Yaffe the Dream Doctors work since 2010
- Participate in ER, pediatric ward, pre-operations, pediatric clinics and more

Eccentric Principles:

- Clown's job is to make the audience feel things, and to **get the audience to breathe.**
- Everyone inhales, but **many of us need to be reminded to exhale.**
- The imagination and the brain are connected to and affect the body. Any change in the mind has a corresponding change in the body. Any change in the body (i.e. **in the breath first**) has a corresponding change in the mind.

Methods

- Prospective, randomized controlled trial
- Children aged 3 to 6 years were recruited between April 2016 and May 2017
- Children were excluded if they had a neurologic, developmental or another medical condition preventing the child from performing spirometry or if they were unable to produce an acceptable first spirometry

Methods

- All children performed a first spirometry with a technician
- After the first spirometry, the children were randomly divided into 2 groups:
 - The first group performed a second spirometry 30-60 minutes after the initial spirometry with an MC present
 - The second group performed the second spirometry with the technician, without an MC present

Results

- 140 children aged 3-6 years were randomly assigned into 2 groups of 70 children each
- One family refused to participate
- Three patients were unable to produce a first acceptable spirometry
- Four children were unable to repeat an acceptable spirometry in their second attempt. 1 was assigned to the MC group. 3 were assigned to the control group

Demographic Data

	MC group	Control group	total	P value
Gender (boys)	46 (65%)	51 (72%)	97 (69%)	0.232
Mother tongue (Hebrew)	44 (62%)	49 (70%)	93 (66%)	0.237
Age years mean±SD	4.043±0.8754	4.000±0.8513	4.021±0.8605	0.769
Height Cms mean±SD	91.879±19.3	98.087±15.6	95.052±17.7	0.042
Weight Kgs mean±SD	19.64±5.5	18.41±5.2	19.04±5.4	0.188

Results

	First spirometry			Second spirometry			difference		
	MC	Control	P value	MC	Control	P value	MC	control	P value
FVC mean \pm SD	89.2 \pm 16.7	89.5 \pm 16.3	0.907	95.3 \pm 15.5	89.3 \pm 19.1	0.046	6.18 \pm 8.72	-1.28 \pm 10.67	>0.001
FEV1 mean \pm SD	91.3 \pm 15.6	94.2 \pm 16.8	0.315	98.0 \pm 15.6	91.8 \pm 19.3	0.042	6.62 \pm 8.92	-3.31 \pm 9.39	>0.001
Expiratory time mean \pm SD	1.58 \pm 0.43	1.7 \pm 0.44	0.12	1.96 \pm 0.55	1.84 \pm 0.52	0.188	0.37 \pm 0.44	0.13 \pm 0.52	0.003

Discussion

- The assessment of pulmonary function in preschool children is problematic
- Currently there is no standard method
- In this prospective, randomized controlled study we examined the option of using MCs as means to improve the performance of spirometry among preschool children

Discussion

- 98% of the patients were able to perform a baseline acceptable spirometry, a relatively high percentage in comparison with previous studies
- Children who were asked to repeat spirometry with an MC present achieved higher FVC, FEV1 and expiratory time
- The increase was significant compared to their first attempt and in comparison with the control group

Discussion

- The medical clowns used different approaches:
 - Explained the maneuver in non-verbal methods
 - Initiated competition with the children, blowing into filters or balloons
 - Blowing bubbles as the child performed spirometry

Discussion

- We did not encounter any patient who suffered from coulrophobia
- This could be, because MCs don't wear face makeup except for a red nose

Discussion

- It is also possible that the presence of MCs has a physiological effect on the respiratory system:
 - A study that evaluated the influence of laughter in COPD found reduced air trapping
 - The presence of MCs reduced the length of respiratory hospitalizations and shortened the duration of respiratory symptoms
 - Levels of salivary cortisol were reduced after MCs intervention which is an indication of reduced stress
- Brutsche MH, Grossman P, Muller RE, Wiegand J, Pello, Baty F, et al. Impact of laughter on air trapping in severe chronic obstructive lung disease. *Int J Chron Obstruct Pulmon Dis*. 2008;3(1):185-192.
- Bertini M, Isola E, Paolone G, Curcio G. Clowns benefit children hospitalized for respiratory pathologies. *Evid Based Complement Alternat Med* . 2011;879125;2011
- Saliba FG, Adiwardana NS, Uehara EU, Silvestre RN, Leite VV, Faleiros FT, et al. Salivary Cortisol Levels: The Importance of Clown Doctors to Reduce Stress. *Pediatr Rep*. 2016;8(1):6188.

Conclusions

- MCs assist preschool children to perform better spirometry
- Further studies are required in order to better understand whether the mechanism is due to better cooperation or true physiological change

תודה גדולה ל:

- טכנאית תפקודי נשימה – מילי יעקובוב
- אחות מרפאת ילדים – רותי סגל
- הליצנים הרפואיים – vovo, waka waka
- קרן רופאי חלום