

Implementation of Therapeutic Drug Monitoring as an Integral Part of Clinical Pharmaceutical Care in a Regional Hospital

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In the context of the hospital's accreditation process, we implemented therapeutic drug monitoring (TDM) as an integral part of clinical pharmaceutical care, with the aim of optimizing pharmacotherapy and enhancing patient safety. The focus was placed on aminoglycoside antibiotics, particularly gentamicin, which is frequently administered across hospital wards.

Aim and objectives:

1. Establish a Clinical Pharmacy Service
2. Evaluate prescribed doses (BMI and ClCr)
3. Assess acceptance of Pharmacists' recommendations



Material and methods:

📄 + 📅 + 👤 retrospective observational study

🏥 General hospital (201 patients)

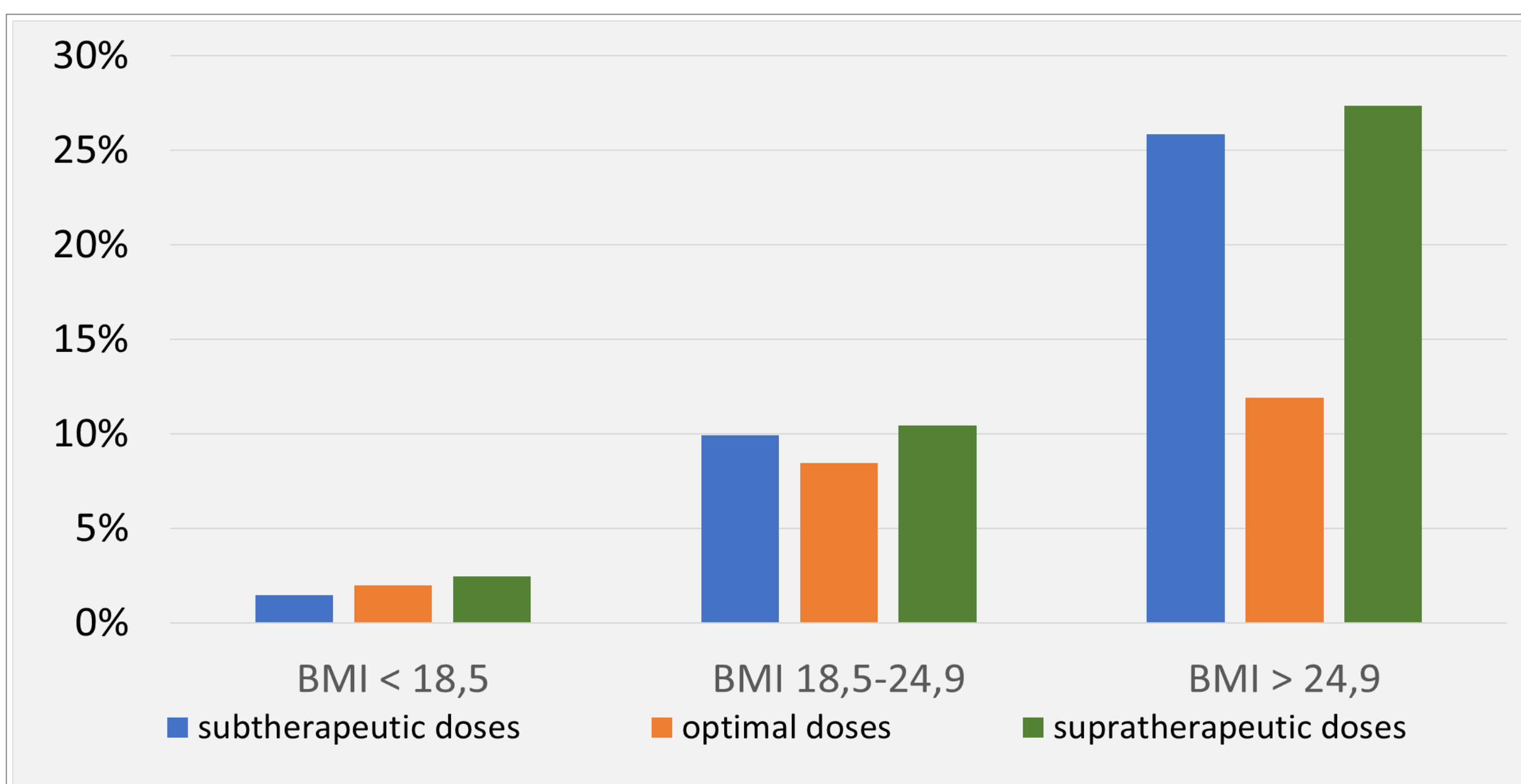
📅 17 September 2022 – August 2025

🧪 drug level determinations provided by the clinical laboratory

💻 MWPharm+ software → 📄 TDM report by pharmacists

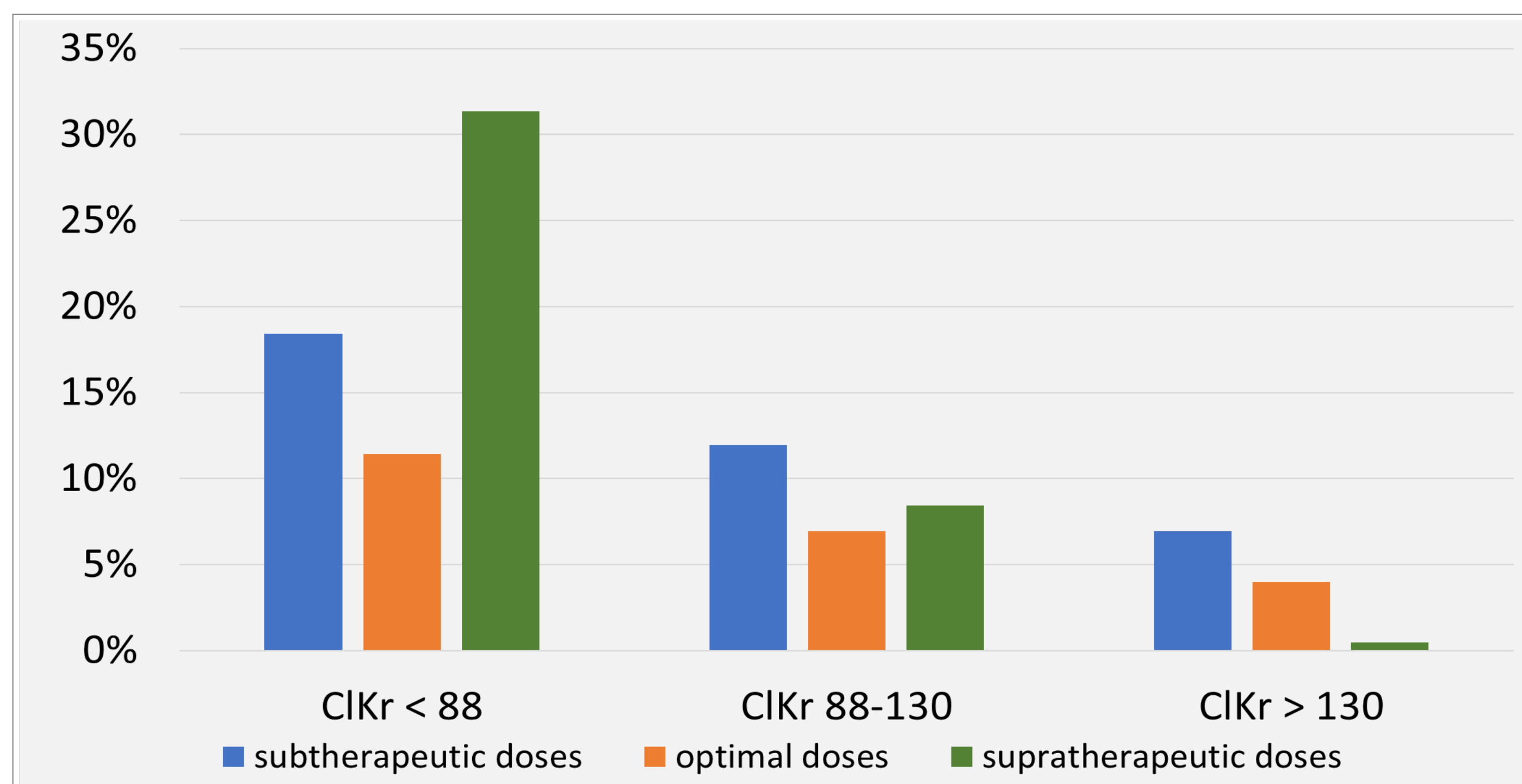
Results: Among the 201 patients included, only 22% (n = 45) received optimal doses of gentamicin, while 77% (n = 156) received inappropriate doses – 37% (n = 75) subtherapeutic and 40% (n = 81) supratherapeutic.

Gentamicin (n=201)	BMI < 18,5	BMI 18,5-24,9	BMI > 24,9
subtherapeutic doses	3	20	52
optimal doses	4	17	24
supratherapeutic doses	5	21	55

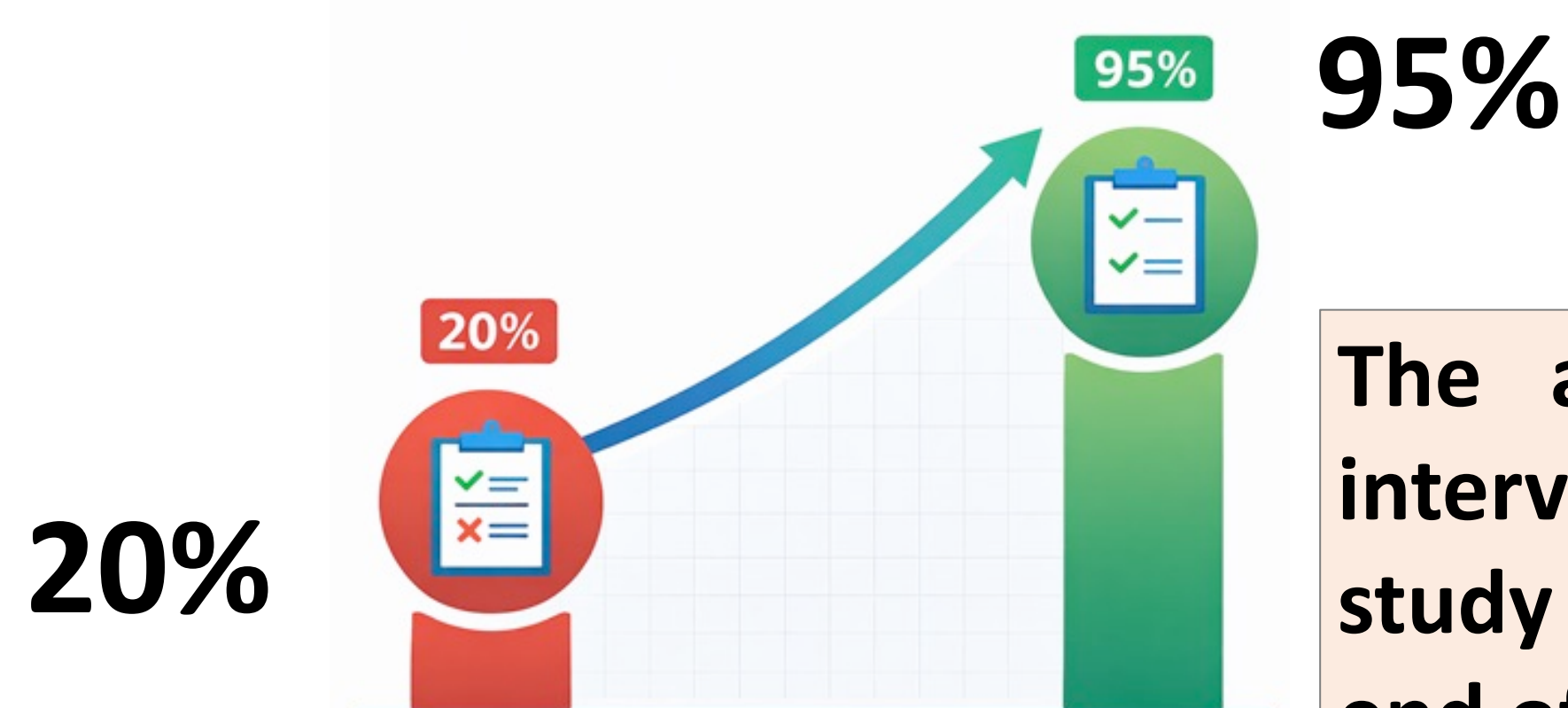


The highest number of inappropriate doses was found in obese patients with a BMI greater than 25 kg/m² (n = 107), of whom 52 (26%) received subtherapeutic and 55 (27%) supratherapeutic doses.

Gentamicin (n=201)	ClCr < 88	ClCr 88 - 130	ClCr > 130
subtherapeutic doses	37	24	14
optimal doses	23	14	8
supratherapeutic doses	63	17	1



In patients with clearance of creatinine below ml/min (n = 123), overdose was prevalent, occurring in 31% (n = 63) of cases. Conversely, in patients with creatinine above 130 μmol/l (n = 23), underdosing was observed in 7% (n = 14). Only 21% (n = 16) of patients with normal renal function received appropriate doses of gentamicin.



The acceptance rate of clinical pharmaceutical interventions increased significantly during the study period from 20% at baseline to 95% at the end of the study.



Conclusion and relevance: In terms of achieving optimal gentamicin dosing, obese patients and patients with renal impairment were identified as groups at highest risk of incorrect dosing. Overall, TDM has become an integral part of clinical practice in our hospital and is increasingly recognized as a valuable tool in optimizing drug therapy.