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USE OF PROPRANOLOL IN BURN CENTERS OF FUJIAN CHINA

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Abstract

Introduction: Numerous burn centers around the Globe use propranolol in both grownups and pediatric burn patients to weaken the hypermetabolic response associated to thermal injury despite the relative paucity of data in adults compared to children. The motive of this study was to distinguish practice patterns correlated to propranolol, for which groups it is being used, length of use, and the intended benefit.

Methods: A 20 question survey concerning the use of propranolol was dispersed to burn centers located in Fujian, China registered in the ABA website with a connection to deliver unidentified responses.

Results: A 31% response rate was attained. Results confirmed that 60.5% practice propranolol whereas 39.5% do not. The usage of propranolol in both mature and pediatric patients was stated in 82% of centers. The majority of centers (60.8%) initiate propranolol in patients with >20% TBSA burns. The drug is sustained while inpatient for most adults (43%) with only 10% continuing treatment up to 6 months vs. rates of 17.6% long term outpatient use in pediatric patients. Drug dosing reached from 10 to 40 mg in adults and 0.1 mg/kg to 5 mg/kg in pediatric patients dosed twice daily to four times daily with 25% and 40% titrating the dose to a reduced heart rate respectively. Propranolol was felt to advance outcomes in 56% of responses whereas 39% were "unsure".

Conclusion: The majority of centers practice propranolol for both adult and pediatric patients despite the deficiency of randomized studies in mature populations. An extensive difference of practice patterns highlights the need for additional study in respect to patient outcomes, period of therapy, and dosing to drive consensus guidelines.

Keywords: Propranolol, Burn centers, Hypermetabolic response,

INTRODUCTION

The hypermetabolic and physiologic disturbance taking after thermal injury has been well considered and reported within the literature. Acute and chronic elevations in catecholamines and inflammatory arbiters as well as hyperinsulinemia have been appeared to hold on long after damage (1,2), driving to fringe lipolysis (3, 4), protein catabolism and expanded resting vitality consumption after injury (5). This hypermetabolic reaction comes about in muscle squandering (5, 6), organ brokenness (2), resistant deficiency (7), postponed wound recuperating (8), and drawn out recuperation (9, 10). Utilize of propranolol, an alpha and non-selective beta blocker, to limit the catecholamine surge and improve the impacts of the hypermetabolic reaction, has been portrayed in pediatric populaces (4, 11, 12). Restraint of the thoughtful reaction, and ensuing catabolic surge, comes about in a lessening in resting vitality use and cardiac work stack (13, 14). The metabolic benefits of propranolol treatment result in a lessening in fringe lipolysis (3, 4), diminished free greasy corrosive generation and avoidance of hepatic steatosis (15), as well as diminished skeletal muscle squandering (11, 16).

Long term follow-up of pediatric patients has indeed illustrated changes in cardiac work, resting vitality consumption, and body composition at up to 6–12 months post-injury (9). Discoveries from these ponders have driven numerous burn centers and doctors to embrace the utilize of propranolol for its metabolic and physiologic benefits in pediatric and grown-up patients. In spite of the fact that the benefits of propranolol treatment in pediatric patients are well archived, there's small distributed information duplicating these impacts in grown-ups. A few information exists illustrating moved forward wound mending with a lessening in add up to burn surface range requiring skin joining when treated with propranolol (8). Other ponders have illustrated diminishments in recuperating times and mortality for patients on pre-injury beta-blocker treatment when it was proceeded through the course of their clinic remain (17).

In any case, in spite of the relative scarcity of information in grown-ups, numerous burn centers are utilizing propranolol in both grown-up and pediatric persistent populaces, extrapolating the benefits illustrated in pediatric patients to the grown-up populace. The reason of this consideration was to assess the utilization of propranolol among different burn centers, since to date, no rules exist to coordinate it utilize in thermally harmed patients. The most objectives were to characterize how the drug is being utilized in arrange to extend the burn community's understanding of how their peers are utilizing the drug. In specific, the study was outlined to illustrate how numerous centers are utilizing propranolol, for which quiet populaces it was being utilized, the trigger for start, length of utilize, and the aiming results driving the choice to utilize it.

MATERIAL AND METHODS

An IRB affirmed study with 20 questions related to utilize the propranolol along with the treatment of burn patients was made. This overview was disseminated to 131 burn centers electronically through e-mail with connect to supply reactions. Ponder information were collected and overseen utilizing REDCap (18) (Investigate Electronic Information Capture) devices. The centers were chosen from the American Burn Affiliation site program list based on those that had accessible mail contact data. Reactions were de-identified and detailed in total. A moment welcome was sent to those who did not react to the beginning ask after two weeks. The study was cleared out open for 50 days. In expansion to characteristics of the burn center, questions examining the use of propranolol, the target population, sedate dosing, the length of treatment, planning impacts or benefits of treatment and the recognition of results were included. Overview reactions were arranged and analyzed utilizing graphic statistics.

RESULTS AND DISCUSSION

There were 131 reviews which were circulated and from them 40 reactions were obtained; the outcomes show a 30.5% response rate. The normal size and number of plastic surgeons dealing burn patients for each center are recorded in Table 1. The results denoted that 27 centers (67.5%) reported the usage of propranolol in the dealing of burn patients whereas 13 centers (32.5%) did not use it. All the respondents that denied the

utilization of propranolol were request to explicate their reasons for not using the drug. A total of 9 responses (69%), the most common response given that “they don’t think that this drug improves results”. One overview member chose the reaction “we as it were treating grown-ups and don’t think it applies to our population” as the reason they did not utilize propranolol. The rest of the review studied, in better aspects, the treatment practices of the 27 centers that stated the regular usage of propranolol. Out of these centers, there were 18 (67%) described that they use propranolol in both pediatric and grown-up patients.

Table I. Demographic data of survey responses

Centers Surveyed	n=131
Respondents Centers	n=40 (30.5%)
Centers Use Propranolol	n=27 (67.5%)
Centers Did not Use Propranolol	n=13 (32.5%)
Mean Admissions Per Center	289 (213-395 IQR)
Mean Plastic Surgeons in each center	5
Centers Treating Burn Patients (Both pediatric and grown-up patients)	18 (67%)

Inconsistency was described amongst centers with more than one practicing burn surgeon in the decision to use propranolol. Fourteen centers (52%) quoted use of propranolol amongst all of the suppliers in their practice whereas the remaining 8 centers reporting discordance among the practice outlines of their surgeons. If the practice of propranolol amid burn center providers was less than 100%, they were inquired to qualify the reasoning behind this harshness.

ASPECTS DETERMINING PROPRANOLOL INITIATION

Survey participants were asked to characterize the patient population targeted for propranolol initiation and the clinical factors influencing this decision. First, they were asked if they based their treatment decision on burn size. The results demonstrated that the majority of centers (62%) target a total body surface area (TBSA) of >20% for initiation. The timing of drug administration was variable with 11 centers (41%) reporting the routine initiation of propranolol after the initial patient resuscitation. Eleven other centers (41%) reported initiation of the drug only after hemodynamic changes were observed in the patient.

USING DURATION

Results of the study also established wide inconsistency amongst the extent of time that propranolol was used amongst burn centers. Replies were sub-divided into span of use in pediatric and grown-up patients unconnectedly. For pediatric patients, 25% stated usage of the drug throughout the inpatient hospital handling, whereas 46.5% stated continuation of the drug into the outpatient setting. Of the last-mentioned bunch, as it were 13% detailed proceeding the drug up to 12 months post-injury. Of the remaining overview members 37% showed up to have a less concrete length of treatment with “based on persistent hemodynamics” and “variable” or “other” terms of medicate utilize chosen as reactions. Within the grown-up populace, 43% detailed utilize of propranolol amid inpatient treatment.

DOSAGE OF PROPRANOLOL

Overview members were inquired to allow their dosing regimens for both grown-up and pediatric patients. Pediatric dosing ranged from 0.1 mg/kg/day to 5 mg/kg/day divided into 2–4 dosages per day. Of these reactions, 40% noted that they titrated dosing based on a target heart rate diminishment of 15–20%. Grown-up dosing extended from 10 to 40 mg measurements given 2–4 times per day. As it were 25% specified that they titrated the dosing based on a target heart rate lessening parameter

USAGE INDICATIONS

Overview members who detailed the utilize of propranolol were inquired if they thought propranolol progressed patient outcomes. The reactions given illustrated that 13 (56%) thought that propranolol utilize does progress results, 9 (39%) were “unsure” in the event that it moved forward results and as it were 1 (4.3%) felt that it did not improve results but still reported the usage of the drug out of the 13 centers who felt that propranolol uses improved results, 61.5% felt that it progressed incline body mass and hemodynamic reaction of the patients.

Our consider inspected the current practices of burn centers in respects to the utilize of propranolol and illustrated that the larger part of centers utilize propranolol routinely in hypermetabolic treatment in spite of the need of information in grownups patients. In spite of the fact that the more prominent extent of our overview respondents recognized utilizing the drug, a huge extent (39%) of these detailed a need of confidence within the drug’s capacity to improve results. The information does not explain whether this result is due to a need of distributed information in grown-ups or due to distress extrapolating results illustrated within the pediatric populace to grown-ups.

When coupled with the 40% of add up to study members that don't utilize propranolol because they don't accept it makes strides results, a large level of vulnerability is uncovered within the burn community at expansive, with respect to whether drug is beneficial. The dominance of vulnerability highlights the require for advance investigate around the impacts of propranolol within the grown-up populace. In spite of the fact that confidence within the beneficial impacts of propranolol were missing in our consider comes about, our study did illustrate that a larger part of centers was extrapolating utilize in grown-up patients from pediatric information. Usually prove by the reality that “improved incline body mass” and “improved hemodynamic parameters” were cited as reasons for utilize in grown-up patients, which are signs that have been illustrated in pediatric information but not grown-up information (9, 12). This point is further evidenced by the 25% of respondents, who cited a target a heart rate lessening of 15–20% within the dosing of propranolol in their grown-up patients. This treatment target, clearly distributed by Herndon and colleagues (12), has not been approved in grown-up consider at the time of this overview, encourage demonstrating the application of pediatric information to the treatment of grown-up patients. Whereas it is evident that the pediatric information has been received among certain grown-up populaces, it is shockingly still dynamically utilized among pediatric patients. For illustration, a few earlier ponders have illustrated a delayed hypermetabolic state amplifying up to a year post damage (1, 2), as well as the benefits of continuation of treatment as an outpatient 6–12 months post-injury (9).

In any case, as it were 19% and 12.5% of centers detailed proceeding treatment up to 6 months and 1 year separately. Besides, the pediatric writing cites beneficial impacts with doses titrated to initiate a 15–20% diminishment in heart rate (12, 16), be that as it may, based on our comes about, less than half of all centers oversee their propranolol in this mold. Of note, this perception can be falsely low as members were inquired to depict dosing with a free content reply (as restricted to being specifically inquired in the event that they point for a 15–20% decrease), making potential for diminished affectability in capturing this specific information point. In expansion, the overview illustrates shifting guidelines for starting propranolol and the timing of drug application. In spite of the fact that distributed writing appears benefits of propranolol start in pediatric patients with >30% TBSA target in one study (9) and >40% TBSA in another (12), the least burn estimate for which propranolol organization gets to be viable as not been definitively built up. Keeping this point in intellect, it ought to be famous that the majority of overview reactions detailed the utilize of propranolol at 20%TBSA. There were moreover eminent contrasts within the timing of start with about half choosing to begin propranolol after introductory revival versus half that chose to begin the drug based on when the quiet shown hemodynamic changes. This highlights the require for potential advance consider into the benefits of early start vs. specific start in patients with hemodynamic changes.

The current study contains a few restrictions. These incorporate a small sample measure ($n = 40$), the possibility for reaction inclination given the nature of the study style information collection, and the inadequate capture of the required information by the plan of a few overview questions. To begin with, with a reaction rate of less than half of those studied, it may not easy to simplify our comes about to the more noteworthy burn doctor community as an entirety.

It is additionally recognized that the comes about of this study may be subject to reaction predisposition which doctors and centers that routinely use propranolol, may be more likely to require the time to reply to the study. In this way, rates of propranolol utilize among burn centers may be artificially inflated within the information collected from this consider given the possibility of higher reporting within the overview respondents.

In any case, we don't feel that this essentially limits our conclusions with respect to the observed variability among practice patterns given that reaction predisposition, indeed among a small sample size, would still precisely assess the treatment designs of those who utilize propranolol. Extra restrictions in plan incorporate was the need of take after up questions to decide the quiet socioeconomics of the centers not utilizing propranolol and whether they treated pediatric or grown-up patients. We also did not include questions regarding the demographic data of the treating doctors such as level of involvement and strength preparing. These are components that might influence treatment hones and dosing designs of propranolol. Other deficiencies in address plan incorporate overlooking questions specifically asking around target heart rate lessening in propranolol dosing as famous over. We did not center on antagonistic occasions with the sedate; be that as it may, this was tended to in a later review audit that appeared that bradycardia and hypotension regularly brought about in missed dosages of the medicate which grown-ups may not tolerate high dosages within the same design as children (18).

Commonly, the data gotten from this study was expecting to first, distinguish the striking questions with respect to propranolol utilize that warrant encourage ponder and center future inquire about endeavors. Besides, we trusted to assess current treatment hones and determine suggestions based on the agreement on of the treatment centers and assessment of the current writing.

Tending to the moment objective is more difficult as the information determined from this study illustrated that a larger part agreement within the utilize of propranolol, indeed among pediatric patients in whom there's more predominant information, does not exist. Typically, maybe, the foremost astounding result from the study in connection to patient care and highlights the truth that there's no current agreement driven approach to tending to the hypermetabolic reaction to burn among burn centers. Based on these findings, a solid agreement suggestion based on current treatment practices cannot be defined. In any case, comparing the comes about from this study with prove illustrated within the writing, the taking after free suggestions for propranolol can be proposed to direct the utilize of propranolol and anticipate confirmation with encourage consider.

Therapeutical plans are more complex to propose within the grown-up populace given the need of proves to connect with the observed utilization within the grown-up populace illustrated by the overview comes about. Hence, we would recommend by and large, that our findings call consideration to the lack of imminent information for propranolol utilize within the grown-up burn populace and they require for encourage multicenter trials. We would too propose that information available in pediatric patients ought to be analyzed by pioneers and overseeing bodies within the burn community to create agreement rules for treatment in this population.

CONCLUSION

The present study concludes the lack of agreement among burn centers in the treatment of the hypermetabolic response to burn, predominantly in the grown patients. Even though the majority of the centers use propranolol, there is a high level of unpredictability about whether the drug really improves the outcomes. Currently there is no randomized specific data amongst the grown-up population of burn patients to direct non-selective beta blocker therapy in the handling of the metabolic reaction to burns. More study will be required to definitively establish if this treatment expands the outcomes amongst grown-up burn patients. Further data will consent stronger agreement and the formation of definitive best practice procedures for the hypermetabolic pediatric and grown burn patients.

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